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ABSTRACT

A handbook for teaching assistants (TAs) at the Department of Physics and Astronomy at the University of Maryland, College Park, is presented to provide information concerning departmental organization and facilities as well as teaching ideas and problems. TAs with the department are either graders who primarily grade homework and tests and graduate teachers who conduct recitations and/or laboratories as well as grading exams, homework, and lab reports. Policies of the Graduate Committee on TAs cover outside employment, what to do if the assistantship is removed, and requesting release from TA responsibilities. In addition to the evaluation of TA and TA awards, teaching hints are offered concerning the classroom, examination proctoring, teaching recitation classes, opening of semester activities, and the introductory laboratory. Support facilities are also covered, including the lecture demonstration area, elementary and advanced laboratories, tutoring facilities, and computing facilities. Policies concerning student injury and telephone use are specified, and information is provided on the Engineering and Physical Sciences Library and the Counseling Center. (SW)

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TEACHING ASSISTANT HANDBOOK 1986-1987

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DEPARTMENT OF PHYSICS AND ASTRONOMY

UNIVERSITY OF MARYLAND COLLEGE PARK

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COLLEGE PARK, MARYLAND 20742

DEPARTMENT OF PHYSICS AND ASTRONOMY
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Division of Mathematics and Physical Sciences and Engineering

PRE-INTRODUCTION LETTER TO THE TA's

The Department's teaching assistant program serves a number of distinct, complementary purposes. For most of you, perhaps the primary purpose is to provide some financial aid to help you be able to afford a graduate education. From the Department's point of view, having a substantial number of teaching assistants allows us to carry out an effective teaching program while at the same time freeing faculty time for research and advising graduate students.

The role that teaching itself plays in your own graduate training is just as important. Whether or not you grant teaching a role in your long-term career plans, the experience of teaching plays an important role in your professional development. All professional scientific endeavors involve communication as well as research skill. It doesn't suffice to do good work, you must also be able to explain it clearly and compellingly to colleagues, students, and perhaps to managers, congressmen, or investors, some of whom will know little or nothing of the technical details. Serving as tutors, especially in elementary courses and labs, is a useful training ground for developing these skills.

In addition, as a teaching assistant, you will be responsible for an important part of the education of a large number of students. For most of you who have come to graduate school directly from college, this may be a larger and more serious burden than you have carried before. Learning to carry serious responsibilities gracefully and competently is an important part of developing into a mature scientist.

Finally, as almost any faculty member will tell you from personal experience, the best way to really learn a subject is to teach it to someone else. If you take your teaching seriously, you will find that your own skills and intuitions will be substantially improved.

Dr. Liu, Dr. Goodman and I are all deeply concerned both that you provide the best teaching you can for your students, and that you receive the maximum possible benefit from your teaching experience. This workshop and the notes collected in this manual are one part of our attempt to accomplish these goals. Many other resources are available to you, including Dr. Berg's excellent (and well documented) Lecture Demonstration Facility, the collective experience of the faculty and senior grad students, your evaluation by your faculty supervisor, and the students' evaluations and comments. Learn to use all of these as part of your teaching experience.

If you strive for excellence in your teaching as well as your studies, I'm sure you will find the experience educational and rewarding.

Angelo Bardasis
Associate Chairman for Academic Affairs,
Associate Professor of Physics

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II. INTRODUCTION

August 1, 1986

As all of you are aware, teaching cannot be taught to a prospective teacher, hence the purpose of the Fall Teaching Workshop and this TA Handbook is not to produce teachers but instead to sensitize you as a new teaching assistant to some of the problems of teaching and familiarize you with the facilities and personnel available throughout your time here to assist you in your work. In addition, we hope that you will meet older, more experienced teaching assistants whom you can refer to for ideas, advice, and friendship.

This handbook was conceived for use in conjunction with the Workshop, its purpose being to provide answers to questions concerning the departmental organization and facilities as well as a brief introduction to teaching ideas and problems. The teaching suggestions are not intended to cover the full gamut of problems associated with teaching since we feel that new teaching assistants will be most helped by meeting with experienced teaching assistants in a relatively informal situation to discuss teaching, its techniques and philosophy. Thus the workshop.

To encourage informality and to provide for the greatest interchange of ideas among the old and new teaching assistants, we have divided the new teaching assistants, of which there are about 20, into 2 groups. Each group has assigned to it experienced teaching assistants to provide a tour of the department facilities which are available to the teaching assistant, and to promote discussions about teaching.

Your best way to establish and protect your reputatuon as a good teacher is to work actively with experienced teaching assistants as well as with the professors who will take an interest in your work. This handbook can offer many suggestions for your teaching activities while here at the University of Maryland and later if teaching is a part of your career.

John W. Layman
Professor

DEPARTMENT OF PHYSICS AND ASTRONOMY

III. ORIENTATION WORKSHOP SCHEDULE FOR TEACHING ASSISTANTS & ALL INCOMING GRADUATE STUDENTS Fall 1986

THURSDAY, AUGUST 28, 1986 - TEACHING ASSISTANTS' WORKSHOP
(All new students are encouraged to attend)

9:30 a.m. - - - - Coffee and Donuts - Rooms Z1219 & Z1221
10:00-10:30 a.m. - - - - Welcome and General Introduction
10:30-11:15 a.m. - - - - Group A Lecture Demonstrations
- - - - Group B Laboratory Tours

11:15-12 Noon - - - - Group A Laboratory Tours
- - - - Group B Lecture Demonstrations

12:00-1:00 - - - - LUNCH

1:00 p.m. - - - - Group A Recitation Teaching Discussion - Room Z3219
Group B Lab Teaching Discussion - Room Z3226

2:30 p.m. - - - - Group B Recitation Teaching Discussion - Room Z3219
Group A Lab Teaching Discussion - Room Z3226

3:45 p.m. - - - - Tea

FRIDAY, AUGUST 29, 1986 - ALL INCOMING GRAUDATE STUDENTS

9:30 a.m. - - - - Coffee & Donuts - Break into Small Groups

10:00-11:30 a.m. - - - - Campus and Departmental Tour
Those relevant parts of campus (e.g. Stamp Union, Eng. Library, North Admin.) as well as a good Department tour.

11:30-1:00 p.m. - - - - LUNCH

It is hoped that the groups will stay together for this, and use it as a bull session.

1:00-2:00 p.m. - - - - Small Groups - Discussions of 1st Year Life
1st year courses
Housing
Dept. Heirarchy, and policies
Loans
Perks
Time management
Qualifier
Social life, intramurals
Anything considered important

2:00-3:30 - - - - TAs - fear and loathing
Time management, assignment and evaluation, what REALLY works, etc.

NON-TAs - fear and loathing
Availability of TAs in other Departments, Time management, etc.

3:30 p.m. - - - - Reception
This is NOT the party for the first year students, that will be the following Friday. This is for the first-year students as well as participating advanced students.

IV. DESCRIPTION OF THE DEPARTMENT OF PHYSICS AND ASTRONOMY

TEACHING ASSISTANT PROGRAM

The Department of Physics and Astronomy has about 70 of its physics graduate students employed as teaching assistants. They are divided into two categories: graduate teacher and grader.

The graduate teachers are responsible for conducting recitations and/or laboratories as well as grading exams, homework, and lab reports. It is expected that a graduate teacher will spend about twenty hours per week fulfilling teaching responsibilities to the Department and to the students. About a quarter to a half of these twenty hours (depending on the course) is in contact with the students in laboratories or recitations, while the remainder is spent in preparation, grading, and holding office hours to meet with students. In larger courses, one graduate teacher is sometimes designated "Head TA;" in addition to teaching this person may be called upon to coordinate grading among the teaching assistants and assist with preparing lecture and lab demonstrations.

A grader is primarily involved with homework and test grading with little, if any, student contact except for holding office hours to discuss homework assignments.

In either case, some faculty members will want their teaching assistants to attend the lectures as a way of insuring that a uniform approach is presented to the students, and as a way of establishing more contact with the students. The time spent here is, of course, part of the twenty hour assignment.

First year teaching assistants are primarily involved with elementary non-major physics courses such as PHYS 106, 107, 117, 121, 122, 141, 142, 161, 262 and 263. Graders may be involved with these courses as well as other departmental offerings. Brief descriptions of some of these courses follow.

PHYS 121 and 122 is a two semester sequence in general physics for students who have had some exposure to scientific methods, but who have not taken calculus. The majority of people in these courses are working toward careers in the health professions or the life sciences.

PHYS 141 and 142 is a two semester general physics course using calculus.This course is recommended for chemistry, zoology, pre-medical and pre-dental students.

PHYS 161, 262, 262A, 263, and 263A are a three semester sequence of lecture and laboratory courses in general physics for students who have some familiarity with calculus. Most of the students in these courses are Engineering majors.

Each of these courses present a unique challenge to the teaching assistant. It should be emphasized that often the strongest human contact with physics that a student has, is that provided by the teaching assistant. Your success in promoting a format for meaningful exchange of ideas and discussions of physics will to a large extent determine a student's attitude toward physics and his/her interest in <u>learning</u>, and any fond recollections that may remain of this often feared encounter with physics.

Assignment Requests

Older graduate teaching assistants sometimes prefer to assist with special honors sections of the above courses, or to grade for advanced undergraduate physics majors courses. Furthermore, some older students like to grade in first or second year graduate courses in order to review for the qualifier. If you should later be interested in doing this, you may contact the professor in charge of the particular course of interest to you and request such an assignment. Both you and the professor should make such a request to the TA Assignment Committee. The Committee will try to honor the request, but is often constrained because of scheduling problems.

The reputation that you gain as a good teacher can often be a major factor in being employed after you complete your Ph.D., so it is worth the time and effort. Building a set of successful teaching assignments does depend on your own personal initiative.

The Physics Department has one of the finest lecture demonstration facilities in the world and you have the chance to learn to use it if you wish. This is frequently to be the goal of the PHYS 708 Seminar on Teaching College Physics perhaps during Spring semester. See Dr. Layman for further details.

V. GRADUATE COMMITTEE POLICIES ON TEACHING ASSISTANTSHIPS

1. Teaching Assistantship Policy (Revised June 14, 1976)

Teaching assistantships will be awarded only to those students regularly pursuing a graduate degree in Physics. For the purpose of assistantship awards:

1) Assistantship duties must be performed in a satisfactory manner as measured by the faculty member whom the TA is assisting and by other such information as questionnaires and student reaction. These measures are to be evaluated by the TA Assignment Committee.

2) Regularly pursuing a graduate degree implies that the student maintains a cumulative average of B in all studies.

3) Regularly pursuing a graduate degree also implies that generally a student will be involved in research, not necessarily on a research assistantship, within one year of passing the qualifying exam or by the third year of enrollment as a regular student.

The renewal of an assistantship is normally for a period of one year; in the case of marginal performance, the assistantship may be renewed for a shorter period. It should be appreciated that all appointments are for a period of at most one year. If the above criteria are satisfied, renewal can generally be expected. Such renewals are, however, subject not only to the above performance criteria, but to the needs of our Department and the availability of Departmental funds for teaching assistants.

A student who fails to pass the Ph.D. qualifying examination on the last try will normally have his assistantship terminated at the end of the semester, following failure. In the event that such a student elects to continue toward a Master's degree, the assistantship may be extended for one semester beyond the one in which the exam was failed in the case of a non-thesis option, or two semesters for a thesis option.

In general, a student in good academic standing who, at some stage of his career prior to obtaining his Ph.D., decides to change programs to a program outside of the Physics Department, may retain his teaching assistantship for a period not to exceed one year.

In general, a student who has completed his Ph.D. will not have his assistantship renewed beyond the semester during which he passes his final exam.

In general, a student receiving a terminal Master's degree will not have his assistantship renewed beyond the semester in which this occurs.

Exceptions to the general rules above are possible with the concurrence of the Teaching Assistantship Assignment Committee and the individual student.

2. Outside employment

Assistants are required to perform their assistantship duties satisfactorily, and are simultaneously expected to pursue their graduate degree successfully. This latter means performing well in their classwork, passing the qualifying examination within the allotted time, and entering into and performing the research work necessary to achieve their degree in a satisfactory manner and at a satisfactory rate.

Normally students find these requirements extremely time consuming. However, occasionally a student may find it necessary or desirable to supplement the assistantship with some outside employment. The Department's only concern is in seeing that the requirements sketched above are adequately met. As a general rule, however, students would be well advised to limit their outside responsibilities in order to meet their educational goals and Departmental responsibilities.

There are some restrictions on outside jobs. Thus, in order to preserve the integrity of the Department, TA's may not tutor University of Maryland students in physics or astronomy for compensation. Further, University regulations state that TA's who wish to hold another part-time position at UMCP concurrently may not hold the second position in the Department of Physics and Astronomy, and may only hold such a position if it comes from Labor and Assistants Accounts (in order to avoid complications concerning fringe benefits). Foreign students are permitted to work only on the campus unless they get work permits from the Immigration and Naturalization Service. Such permits usually are not available during the student's first semester in this country. Because of the current labor situation, such permits are now only rarely given.

To belabor the point, insofar as an outside job diminishes your time to perform adequately your assistantship duties, classwork, exam work, research work, etc., it may jeopardize your assistantship or, indeed, your status as a graduate student.

3. What To Do If You Lose Your Assistantship

Should you cease to meet the requirements set forth in the Teaching Assistantship Policy, you may lose your assistantship. In order to assure that you receive fair treatment should you lose your assistantship, you have the following procedures available to you:

1) Should you be fired:

This will only be done after the Graduate Assistantship Committee (in the case of a TA) or your Advisor/Employer (in the case of an RA) has discussed the situation with you. In all but the most egregious cases, there will be a warning first. Should you be fired and wish to appeal:

a. Go to the Chairman of the Committee on Graduate Education and request a hearing. The Chairman will set up a hearing committee, consisting (primarily) of faculty members of the Graduate Education Committee, which will hear your case. In the case of an RA, since the principal investigator of the contract has the ultimate responsibility for meeting the terms of the contract, the hearing committee can only concern itself with ascertaining whether the firing was capricious, vindictive, or discriminatory (in the sense of the Human Relations Code).

b. If you are dissatisfied with the outcome of the hearing, you may appeal to the Departmental Chairman. He, or his designee, will review your case and make a decision, which will be final.

2) Should your assistantship not be renewed:

This may occur for a number of reasons such as failure to meet the requirements, lack of available positions, change in emphasis of the program's requirements, time limits, etc. Should you wish to appeal:

a. Go to the Chairman of the Committee on Graduate Education who will hear your appeal. (At his option, he may set up a hearing board as above.)

b. This decision may be appealed to the Departmental Chairman (or his designee), who will make the final decision.

4. Request for Release from Teaching Assistantship Responsibilities
(Revised July 18, 1977)

Those who have been awarded a Teaching Assistantship in the Department of Physics and Astronomy are committed to carry out these duties for the 1984/85 academic year (for whatever period the TA was awarded).

If the student who is holding a Teaching Assistantship wishes to be released from this responsibility, a written request to this effect to the Teaching Assistantship Committee is required. The release is not automatic and depends upon:

1) The availability of a suitable person to take on the responsibility of the Teaching Assistantship.

2) The date of the request, i.e., after the start of the fall semester and the early class contact, releases are seldom granted in the lower level courses where there is a considerable amount of TA/student contact.

The requests for release will be ordered by the date of the written requests for release from the prospective teaching assistant. A list of those persons who have requested release is being kept so that a student may verify that his request has been received and recorded. This list is available from Dr. J.-P. Richard.

5. Sample of Summer Teaching Notification

UNIVERSITY OF MARYLAND
Department of Physics and Astronomy

TO: All Graduate Students

FROM: J.P. Richard

SUBJECT Summer TA's

DATE: March 11, 1983

There are approximately 18 T.A. positions available in Physics this summer. If you are qualified and interested in assisting in these courses, please return the attached questionaire to Mrs. Earlene Bradley as soon as possible or no later than March 31, 1983. Physics 121, 122, 161, 262, 429, 602, 621, 624, and 798A will be taught.

In awarding Teaching assistantships, we consider the following criteria in the order listed:

1) Ability: The student must be able to perform the required duties (mostly teaching in the summer) well and at an accelerated pace. The student's past record will be examined for both experience and quality.

2) Academic Performance: The student should be progressing satisfactorily toward a degree.

3) Preference will be given to students actively working on their thesis who do not have research assistantships.

4) Preference will be given to students who because of visa or other similar difficulties have restricted opportunities for other summer jobs.

You may also want to investigate the possibility of joining a research group during the summer even if for the summer only. The booklet "Research in Physics and Astronomy describes the research in our department and lists the members would be a direct way to explore R.A. support in his research area. A summer R.A. at Goddard is also a possibility.

Date handed in _____.

I am interested in one of these positions _____.

I am currently teaching _____.

I have passed the Ph.D. Qualifying Exam Yes _____ No _____.

I am currently engaged in research with Professor _____.

NAME_____.

(be sure to sign your name)

VI. TEACHING ASSISTANT EVALUATIONS

The Department of Physics and Astronomy conducts a student evaluation of each faculty member and teaching assistant every semester by means of a Teaching Questionnaire. Copies of the form are available from Jean Crabill.

In addition, each professor who teaches a course using teaching assistants, records his judgment of his teaching assistant's performance on the form shown below. Both the Questionnaire results and the evaluation card are used in determining TA assignments and the annual Ralph D. Myers Teaching Award.

A copy of the form used by the professor is shown below:

Semester Fall , 19 82 NAME OF TEACHING ASSISTANT:

Last First MI

Instructor's Name _____ Course: PHYS _____

TA Responsibilities: ☐ Recitation ☐ Laboratory ☐ Grading

☐ None of the above (Describe) _____

How many recitations and/or labs taught by this TA did you visit? _____

TA's English is adequate for: ☐ Recitations

☐ Labs but not recitations

☐ Grading only

Evaluation of TA: ☐ Superior

☐ Good

☐ Adequate

☐ Unsatisfactory

Do you wish to nominate this TA for an Excellence in Teaching Award? _____

☐ Really Outstanding (cash prize) ☐ Honorable Mention

Comments:

If you wish to obtain informal feedback on your own teaching during the semester, copies of the simplified questionnaire on the following page are available and may be obtained from Dr. Layman at any time.

None of these evaluations, formal or informal, will appear in your permanent student record nor result in letters of recommendation about your teaching. Public evidence can be obtained by asking the professor to write a letter of recommendation about your teaching when you are preparing your Vita. Experience has shown that a good teaching record can help you find a job.

VII. RALPH D. MYERS TEACHING AWARDS

Every year several students receive awards for excellent performance of their duties as Teaching Assistants. Each recipient receives a check for $125. The letter below is sent to all professors who have teaching assistants in order to select candidates for the award.

TO: All Faculty

FROM: J. Sucher

SUBJECT: TA Award

If you feel that your TA performed the assignments outstandingly, please let me know in a short note emphasizing his area of excellence. The general performance of the nominees over all their assignments is considered, and the TA Award is given for outstanding accomplishments of the assignments whether these include in-class teaching or not.

Approximately one out of every 13 TA's will have received our award during his TA years. Thank you very much.

The Teaching Excellence Committee, which has graduate student members, makes the selection based on these nominations as well as the information from the departmental teaching questionaires.

Recipients of the Awards:

Dimitrios Dimitroyannia	(1985)
Michael Shaw	(1985)
Steven Stochaj	(1985)
Reggie P. Brown	(1984)
Jaime A. Fernandez-Baca	(1984)
Susan Krueger	(1983)
Peter Battelino	(1983)
Bruce Mason	(1983)
Mark Somers	(1983)
Tsung-Cheng Shen	(1983)
Paul Hussar	(1982)
Robert Hwang	(1982)
Charles Lasnier	(1982)
Ramesh Mani	(1982)
Alanna Connors	(1981)
Robert Fasulka	(1981)
Robert Joynt	(1981)
Keith Bonin	(1980)
Ross Erwin	(1980)
Liam Healy	(1980)
David Stork	(1979)
Steve Segur	(1979)
John Geohegan	(1979)
Lyle Roelofs	(1978)
Shyamalendu Pal	(1977)
Mike Ruiz	(1977)
Antoninette Galvin	(1976)
Glen Johnson	(1976)
Poh Hua Ng	(1976)
Lyle Roelofs	(1976)
Greg Clark	(1975)
Robert Merlino	(1975)
James Beall	(1974)
Joanne Murray	(1974)
Mike Ruiz	(1974)
Yuen Han Kan	(1973)

VIII.1 THE CLASSROOM, YOUR STUDENTS, AND YOU*

Introduction

It is doubtful whether one can be taught how to be an "inspired" teacher any more than one can be taught to be an inspired author. Inspirational qualities are not easily codified, let alone instilled. This does not mean, however, that instruction in writing is either useless or impossible. Even the most inspired authors generally adhere to certain basic rules of grammar and syntax, principally because this better enables them to communicate. And the rules can be taught. They will not teach one how to become inspired; rather, they may enable the one who has happily achieved that state to make his inspiration intelligible to others.

By the same argument, there are certain procedures and methods that may be said to constitute the grammar and syntax of teaching. Like the rules of writing, they have evolved from past experiences and the beginning instructor may profit from them. Thus, in the beginning it is probably well to start with what has been found to work in the past.

It is in this spirit that the following procedures are suggested. They are not hard and fast rules, but rather guidelines or cautions. However, while no single instructor will scrupulously observe them all, the student will probably note that many of his better teachers practice a good fraction of them.

* A major portion of this section was originally written by Dr. David A. Goldberg with help from Jearl Walker. It has been modified in succeeding years by other groups working on this Handbook. (July 1973)

It is suggested that you quickly skim over this at the beginning of the term; then after three or four weeks of experience, read it more thoroughly. By then, you will have some idea of your skill as a teacher, and you may find this information even more helpful.

GENERAL

A. Rudiments

1. Face the class whenever possible--you are lecturing or explaining a lab or problem to them, not the blackboard.

2. Speak up--don't be intimidated by the sound of your own voice. Few people can complain that an instructor talks too loudly. ("Eye Contact" can be helpful here; if you are looking at the students themselves, as opposed to their feet, or to the lighting fixture, windows, etc., you will probably find yourself talking loudly enough that they can hear you.)

B. Use of Blackboard

1. Write legibly and large enough so that what you are writing can be seen from the back row.

2. Keep your presentation orderly (i.e., start at the top left board and work around the room clockwise). Students can seldom copy your notes as fast as you can put them on the board. For this reason, the notes should form a logical sequence, not a Chinese puzzle.

3. Don't erase the board until you need it--give the slow copiers a fighting chance.

4. In working problems or doing derivations, don't convert step "n" to step "n+1" by erasing constants or changing exponents. It is a trick one can easily do at the blackboard, but not so easily in a notebook.

5. When you write on the board, try to move around whenever possible so that you don't block the view of part of the class.

6. If you have to draw complicated diagrams, colored chalk can be extremely helpful. (You might even carry a box with you for the express purpose.) One caution--students do not carry multiple colors for their notes.

C. Questions

1. Try to look around for "hands" fairly often. Better still, encourage the students to call out to get your attention. There are few things as frustrating to a student as waving an arm in wild confusion while the lecturer is busily absorbed in intimate conversation--with the blackboard.

2. Never be afraid to tell a student that you don't know something. This way, at least he will know you do not have the answer to his question. (Needless to say, you should have the answer by the next meeting of the class, if at all possible.)

3. The things that trouble the students may not be the same as those that gave you difficulty. Make sure that the question you answer is the same one the student asked.

4. The previous suggestion notwithstanding, try to anticipate questions and prepare for them--but don't give all the answers before the questions are asked. The asking of questions itself is a way of learning.

5. Wait time. If you ask a question, allow at least 10-15 seconds for the students to respond, also encourage all students to participate by directing some of your questions to specific students. After a student has responded wait time can be used to encourage other students to add comments and questions. This reduces you as the "center of the Universe."

RECITATIONS

While the ostensible purpose of recitation sections is to provide a format for student questions, if the extent of student participation is limited to asking questions, most of their potential value is lost. In other words, if your response to a student question is to simply work a problem at the board or deliver a lengthy explanation, then you are in effect turning the recitation into a mini-lecture, and that is not what it should be. The idea should rather be to get the students "involved" and make them think about physics. With these ends in mind, the following suggestions are proposed.

1. If the room is large, have everyone sit up at the front. Those who are relatively far away tend to get "lost" fairly easily. This seating policy should be established at the outset. It then becomes "natural."

2. Learn your students' names as quickly as possible (a polaroid camera may be useful in this endeavor and can be obtained from Mr. Tom Giza in the Elementary Lab Office), and use the names frequently. Besides calling on people by name, you can do this by the device of incorporating their names into discussions of hypothetical situations (e.g., "suppose x is traveling in a car at 50 mph"). It has been observed that this is a very effective device for getting the students' attention.

3. Try to get the students to answer other students' questions (wait time). You may eventually wish to clarify or amplify, but first have the students do some thinking. To this end, it may be necessary for you to ask questions or lead their thinking to keep the emphasis on student participation.

4. Quite probably you will encounter a certain amount of reticence on the part of some, if not all, of the students. To counter this, it will be necessary to do a certain amount of prodding; not simply asking questions, but more nearly telling individual students to answer them. It may not be necessary to do this with all the students, but particularly with the quiet ones it is important that it be done; otherwise the more voluble students will tend to dominate things. You must see that all students have equal access to class discussion and activities

5. To accomplish the above, it may be necessary to overcome a certain reticence of your own, to act in what you may feel is an almost overbearing

manner. (Yes, nice gentle-mannered, you will have to behave just a bit aggressively in public.) You may find this "unnatural" for you, but then a classroom recitation is an artificial situation to begin with. Moreover, as the semester gets on, it will become more "natural" for both you and the class, and the class will respond much more readily.

6. An effective attention-getting ploy, but one which should be used with caution, is to deliberately solve a problem incorrectly at the board! To be most effective, it requires that the students participate in getting the wrong answer (or at least follow closely while you do it). Moreover, it requires that you really understand how to do the problem correctly; otherwise the students may conclude that you simply don't know what you're doing and thereby lose confidence in you.

7. Exaggerated, ridiculous, or (when used discriminatingly) off-color examples are often good ways to get a point across. They are also effective attention-getters.

8. Try to make certain that the students understand what you're doing, and are not just nodding their heads "yes" because they're reluctant to admit "no". (You can sometimes use #6 to break them of the nodding habit.) Never ask "Do you understand this?", the response will be a nod. Ask an additional question that can only be correctly answered if the material is understood.

9. Never criticize a student negatively in front of the class. On the other hand, be quick to use encouraging words when they answer correctly or even when they ask good questions.

10. Prepare in advance by anticipating students' difficulties but remain flexible by being receptive to the problems of the students as they arise in the class.

Laboratory

The ostensible purpose of the laboratory is to provide the student with laboratory experience, however, if the extent of student participation is limited to the mechanical performance of a routine, the value of a laboratory is lost.

Most laboratories attempt to illustrate a basic physical theory or concept, such as confirming Ohm's Law; alternatively some laboratories merely present physical phenomena through demonstrations, and it is the student's task to explain the physics.

Many students will have a difficult time getting started due to their unfamiliarity with the equipment as well as having only a vague recollection of the physics they are to apply. Laboratories can be particularly frustrating for some students. As a Teaching Assistant, you must be able to hint at the direction they should go without doing the lab for them. Many students are able to work through the lab, but nevertheless unable to form a coherent overview of the purpose of the experiment; thus missing entirely the proper conclusions to be drawn from the experiment.

To facilitate your helping the student overcome these impediments, the following suggestions are offered.

1. Many of the hints for recitation also apply here; in particular 3, 4, and 8.

2. Know the experiment. Prepare comments on the laboratory equipment, and possible areas of difficulty for the students before allowing them to begin the lab session. Many courses have a scheduled meeting where the lab instructors perform the experiment prior to the actual lab sessions.

3. If the lab requires write-ups, when you score and correct them write meaningful comments on them which indicate what you had expected in the write-up. Don't just give a score, let the student know how you scored. If the student questions the score and justifies a change, be flexible, discuss it, then give the student the benefit if possible. After the first few labs your need for comments should diminish. Remember, some of these discussions yield insight into the student's problems that can't be gained other ways.

4. Check all the equipment when you first arrive to be sure it is in working order, and when you leave.

5. Help the students get started with well chosen hints, but don't give everything away--let them "discover" things. You are not welcome to consume the student's time with your discussion.

6. Be aware of what each lab group is doing as you circulate to offer help where needed.

7. Be sure things are arranged neatly as the students leave so that the next group will not have difficulty and to enable you to make a quick check of equipment condition, and see that no equipment has been removed.

8. Be sure to report breakage during the lab period so that it may be corrected before the next period. Many repairs can be made quickly by you in the laboratory. Mr. Giza appreciates knowing of faulty equipment.

9. The Department is dependent upon you to see that all equipment is properly cared for by the students. Get to know them so they will share your concern that nothing gets broken or stolen. In these days of tight budgets, it is particularly important to cut down on losses by breakage and theft. Each year the Department expends several thousand dollars to replace such losses. That money might be better spent buying lab equipment or computer terminals that you will want to use.

10. A major concern in any laboratory is safety. As the TA in charge, it is your responsibility to try to prevent any unsafe occurrences from happening (e.g., if students start playfully shining lasers around, you should stop them before the beam hits somebody's eye). If you notice any inherently dangerous situation which might be avoided, please bring it to the attention of Mr. Giza, or of the professor in charge.

11. Should an injury occur, be familiar with the Policy of Treatment of Student Injuries in Laboratories and Shops. An emergency phone exists at the end of the elementary laboratory hallway. A copy of the POLICY ON TREATMENT OF STUDENT INJURIES IN LABORATORIES AND SHOPS is included in Section IX.

LECTURING

If you ask, most of the professors with whom you work would be willing to let you lecture to the entire class on a subject which is covered in the course. This can be an enlightening experience but so that it doesn't become demoralizing, the following are suggested:

1. Organize your notes formally--try to use headings and sub-headings. In addition to making it easier for the student to locate topics in his notes, it may enable him/her to discover (the masterful lucidity of your presentation notwithstanding) where various subjects reach a conclusion.

2. Start your lectures with a brief recapitulation of the previous lecture's development. There is a strong likelihood that the student will not have had a chance to look over previous notes, and this will serve as a reminder. Also useful is a brief outline of what the present lecture will cover. With this initial orientation, the student will be better able to absorb the material and probably take better notes.

3. Students have hard enough trouble copying down all that you put on the board, let alone your interjected remarks. Hence, put important comments on the board as well. If it is really that important, it is probably worth writing down. (If you find it impossible to comply with this, at least wait until they have stopped copying what is on the board before giving a long explanation. Try to speak slowly.) Eye contact with key students will help you gauge the proper pace.

4. It has been estimated from observation that in the larger lectures, at any given time, from 1/3 to 2/3 of the students are day-dreaming. Hence, when you come to an important point, you must first get their attention and then emphasize the point. (A good demonstration or ploy "#7" from the previous section on "Recitations" are possible means of accomplishing this.)

5. If you are running behind, be prepared to terminate your lecture prior to the intended stopping point. While the impeccable coherence of your lecture may be lost in doing so, if you try to speed up and "get it all in," you may still lose your coherence, and probably most of the class as well. If the lecture is really good, it will keep until next time.

6. It is often helpful to divide your lectures into five or six blocks of roughly ten minutes each. This not only makes it easier to pave your lecture, but facilitates your ending a lecture which is running overtime by dropping one or two blocks until next time.

7. Don't try to tell the students everything you know about a subject. It will almost certainly be more than they can assimilate. Similarly, don't include too many topics--leave something for the person who teaches the next course. If you feel it useful to add embellishments, give multiple explanations, etc., but be careful to point out to the students what is the tree and what are the trimmings.

8. If you need to do a long or complicated proof, it helps to outline it in advance (where you are going and how you intend to get there), as well as to indicate the end of the proof and to recapitulate its main steps. The key

word in the previous sentence is "need." Unless there is a particular reason for putting it into the lecture, such a proof should generally be avoided altogether. Most people do not follow long derivations, particularly students at the elementary level. Even if the proof is not given in the text, unless your exposition is particularly illuminating, it would be just as well to make copies of it and distribute it. (The hand-out suggestion might also apply for #3, if you feel you have a lot to say which is important for the students to "get down right.") Blue ditto with spaces for student notes may be best.

AFTERWARD

There are several additional items which do not fit under any of the above headings, but are nonetheless extremely important. The first of these is an admonition. Don't go into class unprepared. Even if the students don't have any idea of what the day's lesson is about, they will very quickly sense that you don't either. There are few things worse for class morale than an unprepared instructor.

The second item is a suggestion which goes beyond the "grammar and syntax" approach and gets more nearly to the spirit of teaching. Stated simply, "Be friendly." Show your students respect and consideration. Show an awareness of the problems they face in the course, e.g., novelty and difficulty of the material, time required out of class, etc. You may find yourself disappointed or even exasperated by the students' inability or unwillingness to learn. Do not display contempt, ridicule, or sarcasm; it will only make things worse.

Friendliness need not by synonymous with informality. The latter, which might manifest itself in the use of first names (by the students as well as yourself), showing up in class in a T-shirt and jeans, etc., is simply one means of conveying an attitude. If informality is your bag, then right on. If on the other hand you feel more comfortable in a more formal atmosphere, don't be a stickler for informality; you are seldom at your friendliest when you're ill at ease.

Several other suggestions on attitude, which may be taken as extensions of the above ideas are as follows. Avoid conveying a sense of self-exaltation by showing how simple and logical physics is to you. Such an attitute generally turns students off. Students shouldn't be surprised nor impressed that you know the material; after all, you are supposed to. What counts in the long run is that the student know the material, and whatever procedures you adopt in your teaching, recitating, or labing should be focused on the "student's knowledge." Foolishness, the reactions you had the first time you encountered the material. Moreover, identifying your reactions with those of your students in this way will help you avoid the pitfall of expecting excessive respect simply on the grounds that you know more physics than they do, after all isn't this expected?

Some students may write in the conclusion of a lab report that the lab was a waste of time, etc.; others may claim that a lecture was boring, etc. Don't be defensive. Try to put yourself in the student's frame of reference. Accept such criticism, thinking of the times that you have said the same things. This will encourage you to make things more lively.

VIII.2 TEACHING ASSISTANT'S LETTER TO HIS STUDENTS

The following is a Teaching Assistant's handout to his students. You may wish to do the same. Check first with your professor.
(Slightly modified for use in TA Handbook.)

TO: Students of PHYS 161

FROM: A. W. Weidemann

On Science and "Testmanship"

When grading your last exam and your numerous homeworks, I was sad to see how poorly many of you did on even some simple problems, although when asked, most of you seemed to know enough to solve the problem. I thought about the reasons for this and came up with the following:

What is physics, and science in general, about? Physics deals with methods of finding solutions to certain classes of problems (some of which are listed in your textbook). The central point, however, is not only to find a solution by stroke of genius or any other conceivable method, but to convince one's fellow scientists (or one's teaching assistant, or, in the case of engineers, some regulatory agency) that the solution presented is a good one, i.e., that it can be derived from generally accepted principles. Thus, an important aim of this elementary physics course is not so much to teach you Newton's laws and numerous formulae (which you'll learn much better in your engineering courses, or forget anyway) but rather to teach you the methods of scientific reasoning.

In consequence, when writing down answers to homework or exam questions, do not give only the solution and above it an unorganized collection of formulae and numbers, which might--or might not--have been helpful in arriving at the answer, but state clearly and in a logical sequence how you arrived at the solution.

Introduce appropriate symbols and draw a clear (and large) diagram to make your argument clearer, and insert numbers only in the end. For example, $\frac{mv^2}{R} = G\frac{mM}{R^2}$ might be recognized by a normally intelligent teaching assistant as the principle "centripetal force equals gravitational attraction," and earn partial credit; however $3.86 \cdot 10^{21} \; \frac{6^2\, 10^{10}}{R} = 6.67 \times 3.5 \times 10^{20}/R$ is not recognizable and thus earns no partial credit. If you base answers to other parts of a problem on a numerically wrong result, you lose even more. If your argument is intelligent (and intelligible), you'll get nearly full credit, even if the final (numerical) answer is wrong. A string of numbers e.g., $A = 3.14^2 \cdot 2^2 \cdot 10^{10} = 12.56 \cdot 10^{10}$ is not enough, $A = \pi R^2 = 3.14 \cdot (2.10^5 cm)^2 = 12.56 \times 10^{10} cm^2$ is much better.

WARNING: On your next exam, you'll get only partial credit, if you arrive at a numerically correct answer in an obscure or unintelligible way (illegible is also unintelligible), say 4 points out of 25. If, e.g., the answer can be derived in 3 steps from a general principle, you get 6 points for stating the general principle and 4 points for each step (and 3 points for the elegance of your argument, or a helpful diagram).

Also, do not forget the units, even in intermediate calculations. Units provide an easy way to check your formulae, e.g.

$$\text{Period } T = 2\pi\sqrt{R/\omega^2} = 2\pi\sqrt{4\text{cm}/25\ \text{s}^{-2}}$$

$$= 2\pi\ 2/5\sqrt{\text{cm}} \cdot \text{sec}$$

is obviously wrong, and wrong by a factor $\sqrt{R}$ (or $\sqrt{\text{some length}}$), as cm sec. is not a unit of time, but sec. is.

"Basic Testmanship." Although not taught as a formal course, taking tests is a science in itself. Students skilled in this subject more than in physics sometimes can score high on a test, although the author of the test tries his best to make his test measure ability in physics, and not in "testmanship." Here are some results of "testmanship science":

- Before starting to work on one particular problem, take time to read all problems at the beginning of the test period. Normally, there is one problem which appears easier or quicker to solve than the others, or which, although nor more difficult than the others, gives more points. Do this problem first, and the most difficult problem last. In other words, be sure to get all the credit for the things that you know.

- Read the problem carefully, until you understand every word completely. If the wording is ambiguous, call a supervisor and ask. Do not assume, e.g., that all angles are measured from the horizontal, unless it is stated in the problem; the assumption of the problem inventor might be opposite to yours; rather ask. Very often students, in their hurry, assume the problem is asking one thing, while in fact it is asking something else. If necessary, state the assumption you make. Partial credit is much more likely if this is done.

- Calculate exactly what is asked for by the simplest method allowed by the problem (sometimes the method might be prescribed to be a graphical method, even though analytical calculation might be easier, or vice versa).

- State (or show) clearly and in a logical sequence what you do (see paragraph one).

- Plan your time. If a particular problem takes too long, abandon it and try another. If you have only 5 minutes left to the end, it might be more fruitful to attempt the next problem than to insert numbers in a complicated formula to gain the last 4 points for a numerically correct answer; $A = \pi r^2$ is nearly as good as $A = \pi r^2 = 3.14 \times (2\text{cm})^2 = 12.56\ \text{cm}^2$.

- Attempt all problems and hope for partial credit.

- Draw a diagram. If possible, write neatly and legible, separate scratch calculations from your mainstream argument; underline partial and final results.

- If you cannot solve on particular problem, don't panic, solve all others first. Then consider that problem. It may be that a constant is given with this problem, or other incidental information, e.g. $\pi = 3.14$, $g = 10\ m/s^2$, which might give you a hint (but be careful, this might be a trap; at my undergraduate school a particularly vicious professor gave routinely misleading constants and hints like "set $\pi = 3$ and $g = 10\ m/s^2$ in this problem" when both quantities were in fact not used in the correct solution).

- If you have time left in the end, check if your answers are reasonable. If you have somehow found a speed twice as great as that of light ($c = 300{,}000\ km/s = 3 \cdot 10^5\ km/s = 3 \cdot 10^{10}\ cm/s$) something is terribly wrong (it might be the problem, however, so don't worry too much). Similarly, the period of a planet circling the sun must be a year or something like this, but probably not 10 seconds of 10^{18} years (which is longer than the age of the universe); also the diameter of an atom is of the order of $1 = 10^{-8}\ cm = 10^{-10}\ m$ but obviously not 10m or 1 km. If the answer doesn't make sense, check it if you have time. If you are pressed for time, at least write something so the grader knows that you know what does or does not make sense.

- Even if you think you have written nothing but garbage for some problem, do not tear it up or otherwise throw it away. Sometimes you can get partial credit for your garbage. In any event, you can't get less than the zero you would get if you turned in nothing.

Commentary to Future TA's.

I wrote the above memo to Physics 161 students after their first exam, on which they did badly (as is usual; inventors of exam questions tend to overestimate their students) and which led to some student complaints about my grading. For the next test nearly all complaints could then be handled by referring to the appropriate paragraph of the memo -- (a common beaurocratic reflex). The last advice ("Even if..." or "Also hand in your garbage") was later inserted by the editor of the T.A. Handbook. When writing the memo, I thought of this but deliberately omitted it, just having graded some 250 exams containing too much garbage anyway.

Please consider preparing your own memo.

A. W. Weidemann

VIII.3 HINTS - EXAMINATION PROCTORING

Carefully proctored, controlled and scored examinations play a major role in determining student's grades. Here are some suggestions from Dr. Misner.

TO: Teaching Assistants

FROM: Charles W. Misner

SUBJECT: Grading Procedures for Examinations

1. As you procter an exam 1) Count the number of student taking the exam, 2) before leaving the examination room you should count the number of exam papers returned, and record the numbers by section on the envelopes in which you collect the exam paper for grading.

2. When grading papers, make some mark on every page you have read (so students and other graders know that that page was not overlooked).

3. Make a swipe mark on every totally blank page you encounter while searching for problems. (This alleviates suspicion that a student may add new work before returning to ask that a problem be regraded.). Also mark other large empty areas you encounter.

4. Record each problem's score in the margin on the back page of the exam booklet next to the appropriate problem number (printed as rule numbers).

5. The last grader to handle an exam should verify that every page has been marked in some way. He should also total the scores on the back cover.

6. On Final Examinations each TA must come to the examination and take role visually to record the presence or absence of each student in any of his sections. When exam papers are collected a written record in the grade book must be made, before the proctors leave the exam room, showing which students have returned exam papers. Any discrepancies with the attendance previously recorded require immediate follow-up.

A Fresh Approach To Teaching Recitation Classes

Robert G. Fuller and Vernon G. Williams

As soon as the instructor sees his recitation classroom as an environment in which he can perfom experiments in learning activities, he can be guided in his activities by some principles of learning.

The recitation portions of large lecture-recitation courses in physics attract numerous criticisms from undergraduate students. Such criticisms are provoked by a wide range of conditions. On the one hand, inexperienced graduate teaching assistants are used in such classes. On the other, senior faculty members give little attention to their recitation responsibilities. We believe that the learning environment of the recitation class can be vastly improved if instructors will pay attention to some learning principles [1] that are operative in this setting. The principles are these:

- *A student must make an active response for learning to occur.* [2]

This point argues for taking the name "recitation" seriously and devising a system of instruction that enhances student responses. Some examples include programmed materials, systematic use of board work, and student-devised problems.

- *Up to 80 percent of learning time may profitably be spent reciting.*

This principle suggests that if the instructor talks for more than 10 minutes of a 50-minute recitation period, he is cutting into time the students could be using profitably to respond.

- *Even sheer repetition facilitates recall, especially if the repetition is strategically placed.*

An example of a schedule which can be used to facilitate recall involves repetition: (a) immediately upon hearing, (b) five minutes or so later, (c) one-half hour later, (d) several hours later, and (e) a day or more later.

- *Learning is enhanced as the learning situation becomes increasingly similar to the situation in which the results of the learning are to be used.* [3]

One can ask himself, What can be done in the recitation section to make learning more nearly like performance? If a section is composed of engineering students, for example, one might have them work in groups, since many work settings for engineers involve team-based projects.

- *Both concept acquisition and the transfer value of learning can be furthered through use of a variety of applications of the concept or principle to be learned.*

Much of the time in recitation may be spent having students apply to several different settings the concepts and principles introduced in lecture. This procedure obviously requires careful planning to insure systematic development of application settings.

- *In many instances facilitating learning may be formulated profitably as retarding forgetting. The problem is then one of information storage and retrieval, and the organization of learning becomes paramount.* [4]

The lecture organization which is obvious to the lecturer may be quite obscure to the student. Recitation time can be spent in showing the students a framework in which they can place the learning they are being asked to do. Perhaps even better, the students may be asked to develop their own organizational structure for the material covered in lecture. Certainly this latter procedure should produce more student response, the first point in our list.

- *Material is learned more readily when objectives for the learning are stated in clear, observable form.* [5]

It is useful not only to present overall objectives for the recitation class, but also to state at the beginning of each recitation hour the objectives for that hour in terms of what students actually are to do during the hour.

- *A common goal among a group of learners is likely to enhance the performance of the entire group.* [6]

Some attempt to identify and/or establish a common goal among members of the recitation class is likely to be repaid in terms of increased student learning. It seems the rare occasion on which mere statement of a course goal makes that a shared goal of the participants. If all else fails (and this does not imply that this goal is necessarily the meanest of all possible goals), most students are likely to be united in striving for the best possible grade they can get from the course.

Dr. Fuller is associate professor of physics, and Dr. Williams is associate professor of educational psychology and director, Counseling Center, The University of Nebraska, Lincoln, NE 68508.

- *Feedback to the learner about where he is in the learning process and how he is progressing can increase his learning.* [7]

The recitation section seems almost ideally designed for implementing this principle. Not only formal examinations but also instructor comments and responses to individual students can provide the necessary feedback.

- *Learning is heightened by consequences satisfying to the learner.* [8]

Satisfactions potentially to be found in a recitation section are legion: peer recognition, instructor approval, social approval, point systems, and self-monitoring, among others. The pity is that these sources of satisfaction seldom (one is tempted to say never) are used systematically in the classroom learning situation.

- *The learner's peers are an exceedingly potent source of motivation for learning.*

The presence and presumed interaction of peers is inherent in the recitation section. Regrettably, the lack of systematic use of this principle is widespread. It might behoove teachers to develop a basic acquaintance with group dynamics principles so that this source of motivation can be exploited more systematically.

- *Learning is enhanced when teacher and learners share responsibility for learning.*

Implementation of this point is tricky. It is a difficult matter to reach the proper balance of instructor-student responsibility in a course, recitation or otherwise.

In the above learning principles we find many suggestions for improving the learning environment in physics recitation classes. As a specific example, let us take a typical large ($\sim$ 160) lecture-recitation course in physics for engineering students. Furthermore, assume that the amount of physics each student has learned is assessed on the basis of his performance on four 1-hour examinations during the semester and a 2-hour final examination at the end of the term. The examinations consist primarily of quantitative problems similar to typically assigned homework problems. In such a situation the recitation class serves at least one important function: to help students develop their quantitative skills through problem solving. We suggest trying a personalized approach to such a class. [9-10]

The instructor goes to the recitation class with a number of problems (say three or four) to give the students as short tests to be worked in class. If the instructor wishes to encourage the students to work problems from the textbook, he may select these problems from the book. If he wishes to expose the students to a broader range of problems, he may select them from a wider variety of sources.

Each student is given one problem to work at the beginning of the class; if the problems are distributed at random, adjacent students will be working on different problems. The instructor may allow as much student interaction during this testing time as he desires. When a student has completed his problem, he brings it to the instructor for grading. In this process the instructor can give immediate and appropriate feedback to the student about his performance.

If the student has the problem completely correct, he is invited to help grade that problem for other students. He becomes a proctor, assisting the instructor in providing assessment and feedback for the class. If the student has made an error in attempting to solve the problem, he can be given instructions on how to work it properly and then be given another. Students who complete their work after a proctor has already been obtained for their problems may be given another to do.

At all times the instructor is involved in dialogue with students about problem solving and the appropriate concepts to be invoked. If certain misconceptions or learning deficiencies become apparent to the instructor, he may wish to stop the class and give a set of instructions or a minilecture on related course material. If the instructor wants to provide quantitative rewards for performance in the recitation class, he may give class grades, for example, $A+$ for proctoring, A for getting all problems correct, B for getting all but one problem correct, and so forth. Furthermore, the instructor may change the problem-solving emphasis by varying the types of questions that he gives to members of the class. This type of recitation class heightens peer group interaction and provides numerous opportunities for the students to obtain personal help in their learning activities.

The above example is only one of many possible styles of recitation class instruction that make use of some of the learning principles we have discussed. As soon as he sees his recitation classroom as an environment in which he can perform experiments in learning activities with students, the instructor can be guided in his activities by some principles of learning. He will discover that learning occurs best not when he is the actor and students are the audience, but rather when he is the prompter and students are the actors. ■

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VIII.5 OPENING OF SEMESTER ACTIVITIES

John W. Layman (Giza, Monroe and Smarsh)

In past semesters we have noticed a number of things occuring at the opening of the semester that can create a bad impression on students even before they attend their first physics class. Also a few of these difficulties persist during the semester.

1) There are frequently no TA's to meet the first laboratory and recitation sessions.

   Although some professors may not have created labs or recitations for registration week, TA's should be asked to meet these labs and recitations. They can introduce themselves to the students and get to know them before the hard work begins. The students will appear even if the TA does not.

2) Please give Mr. Giza, Mr. Monroe or Mr. Smarsh lists of the TA's assigned to their areas and tell them of laboratory plans.

   Professors should let these men know of the lab schedule <u>at least one week</u> prior to the first week of course work. They will be glad to post signs, etc. if they know what is to transpire. In case of equipment conflicts between courses, first-come-first-served is policy as far as experiment schedules are concerned.

3) There have apparently been some difficulties with individual TA's not doing their work in the laboratory, not appearing on time for labs, nor attending lab practice sessions.

In light of some of these problems I am making the following recommendations:

1) That all TA's be asked to meet their first recitations and labs even if there is no formal activity scheduled.

2) That all TA's assigned to laboratory be given a copy of "The Introductory Laboratory, Hints and Responsibilities."

3) That each TA be encouraged to prepare a "Modest Handout" to be given to their students at the first meeting.

   Your Name
   Office Number
   Office Hours
   Phone Number

   (Write your name on the board each period for the first few weeks. Be sure each student knows who you are.)

Prepare a brief handout in your words as to what you expect of your students in laboratory/recitation. Hints for good reports/homework with ideas of how you will score their work. State clearly the:

Rules for handing in reports/homework;
Rules for attaining the score on their work;
Rules if they miss laboratory/recitation, and how to make up work.

4) Borrow from Mr. Giza, Mr. Owens or Mr. Monroe a Polaroid Camera. Take pictures of your students in groups of three. Have them add their names. Prepare a small poster (see example in the elementary lab hallway opposite Mr. Giza' office) to use to learn the names of your students and to post in lab during the first few weeks so they can get to know each other.

If, as the semester progresses, TA's are observed not doing a good job, a copy of the Hints and Responsibilities document with the difficulty circled can be given to the TA, a copy to the professor responsible for the TA, and one for the elementary lab file.

VIII.6 THE INTRODUCTORY LABORATORY

Hints and Responsibilities

The success of the laboratory program depends upon the TA as much as the equipment and the experiments. You have certain responsibilities and obligations which must be carried out. This list may seem obvious but is often ignored by a surprising number of TA's.

1. You must appear 10 minutes before the laboratory is to begin - unless you are meeting the same students in recitation, and will arrive with them.

    a. Check the general lab condition.
    b. Be sure the proper equipment is there.
    c. Check with the previous TA as to faulty equipment. (Please use a Red Tag to mark faulty equipment and report this to Mr. Giza, Mr. Owens or Mr. Monroe.)
    d. Check out to the students special equipment such as multi-meters, timers, digital multimeters.
    e. Be sure that each is returned before any students leave the laboratory.
    f. You must be present in the laboratory at all times.
    g. To prevent senseless vandalism (all knobs of oscilloscopes, screws out of front panel of signal generator, spectroscopes dismantled) you must circulate among all the students. Preventing this type of damage is clearly your responsibility. The better you know your students the less likely there will be such vandalism.
    h. Enforce the "No Smoking" and "No Bare Feet" rules.
    i. Be sure that students return equipment to a neat arrangement so you can take a visual inventory of correct apparatus and detect broken apparatus.
    j. Be sure windows are closed, lights are out, and the doors are locked.
    k. Do not admit the students of the following class unless the TA has already arrived.
    l. Enforce normal safety rules and know where the emergency phone is and how to use it (see Section IX). This is especially important for TA's teaching night labs.

2. You have other responsibilities outside of the actual laboratory period.

    a. Attend the scheduled Course TA Meetings.
    b. Be thoroughly familiar with the experiment, the equipment, the procedures to be used by the students.
    c. Anticipate the difficulties that inexperienced students will have. Warn them and help them.
    d. Unless you are circulating, asking questions, checking the operation of the equipment, etc., students will have great difficulty.

You are responsible for seeing that the students have a successful lab experience as well as for scoring whatever report they submit. In fact, the greater their success in lab the easier will be your job of scoring the reports.

If you know you are having problems, don't wait to seek help. Talk with your professor, an experienced TA, Dr. Layman, Mr. Giza, or Mr. Monroe. Just as your task is to help students succeed, we are quite willing to help you be a successful TA.

VIII.7 BARDASIS MEMO TO FACULTY

DEPARTMENT OF PHYSICS AND ASTRONOMY
University of Maryland

MEMORANDUM August 1984

TO: All Teachers of the Larger Physics Courses (Fall and/or Spring)

FROM: Angelo Bardasis

SUBJECT: SOME GENERAL SUGGESTIONS

These comments stem from suggestions made by students, TA's, staff, and you:

A. Registration

Students may come to you saying that the section they need is filled, and asking for your permission to register in that section. Do not give such permission. Jean Crabill and I will be keeping count of the size of the sections and the Registrar will be keeping a waiting list. Tell students to be sure to get on the waiting list and to keep checking with the Registrar. While one more person in your lecture may not be noticeable, it may significantly overcrowd an already overcrowded lab, or overwork an already overworked TA.

B. Use of TA's

1. If you have recitations and/or labs, schedule a meeting once a week to go over what you want done in the coming week and to find out from the TA's how much is getting through to the students. A ten-minute meeting at the end of your class is not sufficient - I suggest you have a bag lunch. If you have a lab, you should meet in the lab and actually do the experiment. (Whenever this has been tried, it turns out that some non-trivial fraction of the experiments can not actually be done as described in the write-up! Please tell Mr. Giza or Mr. Monroe about any errors you find.)

2. Many professors like their TA's to come to class. This is a good procedure as it allows the TA to cover the material giving the same emphasis as the professor does. It also gives them a chance to detect the origin of student misconceptions. If your TA only grades, this gives him/her a chance to meet the students and vice-versa.

Some professors find it helpful to have the TA take notes and put them on reserve at the Undergraduate Library.

Should you do any of these things, remember that they take time and the TA will consequently have fewer of the 20 hrs/week left over for other things you want done.

3. The TA's can and should be a vital source of feedback from the students. Often there is some problem, such as the level of the lectures, or the nature of the exams, which can easily be cured if only the professor knows about it. Please encourage the TA's to provide you with feedback, especially if it turns out to be a reflection on your teaching. You might consider teaching a section yourself, just for the experience.

4. It is important to visit each of your TA's during a recitation to see how things are going, make suggestions (privately, after the class), etc. Do this early in the semester.

5. Occasionally you may have a TA who would like lecturing experience. If you have confidence in his/her ability, you might want to let such a TA take a lecture for you sometime. Just to emphasize that I am interested in improving teaching, not in giving you a day off, let me add that you should attend the TA's lecture and discuss it with the TA both before and after the class.

6. Usually there are no recitations or labs scheduled during the first week. Nevertheless students often show up anyway. The TA's should be asked to meet these labs and recitations. They can tell the students when they should come, and can take advantage of the situation to introduce themselves and establish informal contact. At the very least, you should make sure that there are signs posted explaining when the labs will start. This is particularly crucial in the PHYS 262A, 263A labs which only meet alternate weeks.

7. Attached are two handouts that John Layman gave to his TA's: the first for all TA's, and the second just for those teaching labs. You will probably prefer to use your own version, but the suggestions are useful.

C. Lab Manuals

If there is a laboratory in your course, please check over the lab manual. Various problems plague these manuals. One common problem is that the references may be to a text no longer used. Either update these references, if it is not too late (see Stephanie Smith), or prepare a handout for your students.

Also, errors in physics and in procedures, misprints, confusion, and other mistakes continually find their way into these manuals. Should you note any of these, please tell either Mr. Giza, Mr. Monroe, or the faculty member in charge of the labs (for 262A and 263A this will be Gus Zorn; for the other labs it will be Doug Currie).

D. Tutoring

Students having trouble should be encouraged to see you and/or their TA. If the student needs still more help, you should be aware that the Department provides free tutoring for students who want additional help in solving problems. This tutoring service is described in a brief memorandum, prepared as a handout to the students at the time of the first lecture, and attached here.

The tutoring for PHYS 121, 122, 141, 142 and 161, 262, 263 will be done in Z-1214 by the staff of the Slawsky Clinic: Gene Beach, Joe Kirshner, Max Solow, Josh Stern, Mitch and Zak Slawsky.

TA's should be encouraged to discuss the solutions to the assigned problems with the Clinic staff. The Clinic has been found to be quite useful by a number of students, so be sure yours are told about it and encouraged to use it. After exams you might remind your students about its existence.

Quite obviously, the Clinic will work best if you cooperate with it, providing copies of exams, homeworks, exam grades, etc., so that the tutors can best see what you want from the students and which ones are having the most trouble.

E. Administration

1. Reproduction of handouts. While it is easiest to run off 150 copies on the walk-up copier, it is probably not the cheapest way. The Department spends $50K on copying. For this reason please talk to Gene Barth about the cheapest way to reproduce your handouts. Printing and dittoing your handouts are frequently more appropriate.

   Please encourage your TA's to use the cheapest method possible.

   By using the bulletin boards, e.g., to post homework solutions, instead of making handouts, you can save the Department the reproduction costs. A key to a bulletin board may be obtained in the Lecture-Demonstration area.

2. Administrative Computer Programs. Dick Berg is now accumulating a library of computer programs for administrative purposes in large courses, e.g., for generating class lists, for recording grades, and for doing various cabalistic calculations. If you want to use one, check with him. If you have written one yourself, please see that he gets a copy.

F. Exams

1. Copies of exams for main office. Two copies of all exams should be sent to Stephanie Smith in Z-1120 so that students can see the exams given in previous semesters.

2. Test Administration for Disabled Students. The Disabled Student Services Office will administer your test to students whose disabilities make it difficult for regular classroom administration of exams. Should you need this service, please contact my secretary, who will let you know what procedures must be followed.

G. Cheating

Unfortunately, cheating is often a serious problem in these large courses. You must make reasonable efforts to discourage it. Several points are worth mentioning:

1. Be sure that a duplicate of grades is kept. We have had problems associated with a lost set of grades. We also had one set of grades that disappeared and reappeared edited. Please be very careful about this.

2. In these days of contested litigation it pays to be exceedingly careful. If there is an apparent case of cheating, plagiarism, etc., please follow the rules precisely. They are listed on page 54 of the 1985-86 Undergraduate Catalog, under the heading, "Academic Dishonesty." Do not approach the student! Come to me first (as representative of the Department Chairman for this purpose). Previous experience has indicated that you need a good case to make it stick.

3. As indicated in the attached handout from John Layman, it is useful from the educational point of view for the TA's to take polaroid photos of their students in order to get to know them. This is also useful later on when strange people start showing up in the examinations claiming to be your students. For the latter purpose, it is useful to have the TA's make up a seating plan during the exam so that all examinees are identified. The plan is useful later when evidence of copying shows up in the exams.

4. Students have been known to take another student's exam, erase the name and write their own name on it. To prevent this, insist that all exams have the student's name written on the cover in ink.

5. A common ploy is for a student to ask that his/her exam be regraded on the grounds that something has been overlooked. In such cases, there is a non-trivial chance that the "overlooked" material wasn't there when the exam was first graded. To prevent this, an announced policy of xeroxing a random sampling of exams before they are returned can be very effective. We have caught several students by comparing the exams they turned in for regrading with the xeroxed version. Announcing the policy seems to cut down the number of such cases. Any students asking for regrading on one exam should automatically have their next exam xeroxed before returning.

H. Grading

Grades should be distributed using more or less the same standards for different sections of the same course. This means you should talk to other faculty teaching your course. I have the statistics on grade distriubtions for a random selection of recent semesters in my office.

Often a problem arises because one of your TA's grades differently than the others. Clearly the grades should be renormalized in that case, but you should never lower a students' grades in the process -- always raise the other student's grades and adjust your formula to give you the desired result.

Obviously, if you publish a formula for assigning grades, it should have enough flexibility for such contingencies.

I. Posting of Grades

The posting of grades violates the confidentiality law, even if the grades are only identified by social security numbers (or even just a few digits of the SS #). A simple way around this is to have a waiver written on each exam, which the student signs, saying "The instructor has my permission to post my grade identified by social security number." Those few students who do not wish to sign such a waiver can have their records whited out before the grades are posted, either by hand, or automatically if your grades are on the computer. (You might state on the exam that no grades will be given out any other way.)

If you don't arrange some way to post grades in these large courses, you will have a hundred students coming to your office or calling you for grades. (You should never give out grades or other confidential information over the phone.)

J. TV

The Department has the capability to videotape lectures or any other material you care to present. Dick Berg can help you with whatever your needs or desires are. This capability can be put to a variety of uses:

1. Videotaping your lecture for your own edification.

2. Review sessions can be videotaped and left at the Hornbake Library Non-Print Media Center (call Allan Rough (pronounced Rau), x 4723, for details). The tapes can either be on reserve there, to be checked out to UGL video monitor, by students, or played repeatedly, every hour for a week, in the "Dial Access" set-up, where the students just tune into your channel. This can be quite useful before exams, and has been used successfully by several of our faculty members. Once made, the tapes can obviously be used in successive semesters.

3. We will be videotaping some of the larger classes on religious holidays, so that students who observe these holidays will also be able to observe the classes that they missed. Dick Berg and/or I will contact some of you about this.

K. Religious Holidays

The official campus policy is as follows:

> "Examinations and tests: All examinations and tests shall be given during class hours in accordance with the regularly scheduled (or officially 'arranged') time and place of each course listed in the Schedule of Classes and/or the Undergraduate Catalog. Unpublished changes in the scheduling or location of classes/tests must be approved by the department chairman and reported to the Provost. It is the responsibility of the student to be informed concerning the dates of announced quizzes, tests and examinations.
>
> "It is the policy of the University to excuse the absences of students that result from religious observances and to provide without penalty for the rescheduling of examinations that fall on religious holidays. Examinations and tests may not be scheduled on Rosh Hashannah, Yom Kippur, or Good Friday.* An instructor is not under obligation to give a student a make-up examination unless the absence was caused by illness, religious observance or by participating in University activities at the request of University authorities.
>
> "A make-up examination, when permitted, must be given on Campus, unless the published schedule and course description require other arrangements. The make-up examination must be at a time and place mutually agreeable to the instructor and student, cover only the material for which the student was originally responsible, and be given within a time limit that retains currency of the material. The make-up must not interfere with the student's regularly scheduled classes in the event that a group of students require the same make-up examination; one make-up time may be scheduled at the convenience of the instructor and the largest possible number of students involved. Under the same guidelines students shall have equal access to all information and drills missed due to the reasons listed."

*For the academic year 1985-86, this means Monday and Tuesday, September 16 and 17 for Rosh Hashanah; Wednesday, September 25 for Yom Kippur; and March 28 for Good Friday. (An additional problem day is likely to be April 24 & 25 for Passover.

For classes in the lecture halls (Z-1410 and 1412), we will videotape your lectures that fall on Rosh Hashanah and/or Yom Kippur (see Section J, numbers 2 and 3, above).

An additional problem occasionally occurs when finals are scheduled on Saturdays. It is well to anticipate this, as there is no time after the final to start finding the students who can not take Saturday exams because of religious observances.

L. Snow Days

Occasionally the University is suddenly closed (because of snow) on a day you have scheduled an exam. You should state, at the beginning of the semester, what your policy in such a case will be (e.g. the exam will automatically be moved to the next class day, the exam will be rescheduled to a later date, etc.).

M. Calculators

A policy on calculators should be stated in your course. That is, all students must have, may use, or may not use calculators in tests. (Slide rule function calculators can currently be bought for under $20, not an unreasonable investment for students taking PHYS 121, 122 or a more advanced physics course.)

An interesting possibility of high-technology cheating arises with the advent of the non-volatile memories. Where appropriate, you may have to press the CLEAR button on each student's calculator at the start of an exam. With the advent of pocket calculators, such as the HP41C and the TRS 80, with alpha-numeric capabilities, this can become a serious problem.

IX. STUDENT INJURY POLICY

DEPARTMENT OF PHYSICS AND ASTRONOMY
UNIVERSITY OF MARYLAND
College Park, Maryland

1. Emergency assistance (police, ambulance, fire department) is available by calling campus extension 454-3333, or by using a yellow campus emergency phone.

2. First aid supplies are available next to the emergency phone within easy access of the laboratory areas. The aid supplies shall only be used for rendering first aid.

3. After first aid has been rendered, and the laboratory technician notified if he is present, the student shall be referred to the Health Center, i.e., the student MUST be told to go directly to the Health Center. Failure to refer the student to the Health Center could result in later legal problems.

4. After first aid has been rendered, in the case of serious injury emergency assistance must be called (X3333 or the yellow emergency phone).

5. When requesting emergency assistance for injuries, the person calling X3333 should state the nature and extent of the injury. This information will determine the emergency response. Very minor injuries may be transported to the Health Center by a University Police officer, more serious by ambulance. Para-medics are dispatched to the most serious injuries such as cardiac arrest, person stopped breathing, and severe burns.

6. No one is authorized to give any medication to an ill or injured student unless requested to do so by a physician.

7. Ms. Lorraine DeSalvo of the Physics Department maintains a log book to indicate the date, student's name, description of injury, and disposition of the student. In the case of any injury, an entry should be made in the log book. If the student refuses to go to the Health Center, this shall be recorded in the log and the student shall sign the log indicating that he/she declines treatment from the Health Center. Contact Ms. DeSalvo, Mr. Giza, Mr. Monroe or Mr. Smarsh. The log pages may be found in the First Aid supplies and must be filled out completely at the time of the accident. Give this to Ms. DeSalvo, Mr. Giza, Mr. Monroe or Mr. Smarsh.

EMERGENCY PHONE LOCATION

3rd Floor at the junction of the main hall and the lab wing.
(Marked with a sign handing from the ceiling)
Adjacent to Room 3303

FIRST AID SUPPLIES

In cabinet next to Emergency Phone
(TA Key to building unlocks the first aid cabinet)

Prepared by J. Layman, Approved by D. Falk. (9/3/80)

DEPARTMENT OF PHYSICS AND ASTRONOMY

STUDENT INJURY LOG

CAMPUS POLICE: 3555 (if student is ambulatory)
EMERGENCY: 3333 (if student is NOT ambulatory)

DATE	NAME (SOC. SEC. NO.)	LOCATION (RM.& BLDG.)	DESCRIPTION OF INJURY	DISPOSITION	PERSON REPORTING INJURY	SIGNATURE OF STUDENT DECLINING TREATMENT BY HEALTH CENTER

EMERGENCY FIRST AID INSTRUCTIONS

Emergency Number - Ext. 3333 - Yellow Phone In Hallway

1. Eye contamination (chemica or other foreign material in eye). IMMEDIATELY begin flushing eyes with plain water for a minimum of 15 minutes. Use an eyewash fountain, if possible, but if one is not available, use whatever clean plain water is available. TIME IS CRITICAL!! If decontamination is not started within 10-20 seconds, some eye damage may occur. Someone should assist by helping to hold the injured individual's eyelids open. In some cases, the eyelids may have to be forced open to allow proper flushing. NEVER ASSUME THAT AN INJURY HAS NOT BEEN SUSTAINED.

2. Chemicals on the body. Corrosive chemicals can cause severe burns (third degree) if thorough flushing with plain water is not begun immediately and continued for at least 15 minutes, following exposure. In the case of a large spill over clothes, all clothing, including shoes and socks should be removed at once in the safety shower. Do not allow the student to put these clothes back on; they may be contaminated.

   Where the student is wearing his chemical splash goggles, it is advisable to keep them on to prevent the corrosive from being washed into the victim's eyes. This is only true if the corrosive has not already gotten into the eyes.

3. Inhalation of chemicals. Never assume that even short exposure to corrosive chemicals or high concentrations of any chemical, dust or vapor, has not produced lung damage. Pulmonary edema can develop hours after exposure. No first aid treatment should be given other than removal of the individual to fresh air.

4. Ingestion of chemicals. Determine conclusively what it is at once!! CONTACT MD POISON CONTROL CENTER (1-800-492-2414). Confirm that the first aid procedure listed on the precautionary warning label is acceptable to the physician. Begin the procedure at once if it does not involve vomiting. If vomiting is involved, request an ambulance immediately by calling extension 3333 and DO NOT administer first aid for ingested poison.

5. Burns. (a) Chemical burns - immediately flush with water (15 minutes); (b) Thermal burns - for first and second degree burns immerse in cold water (no ice), for third degree burns have the victim lie down.

6. Heavy bleeding. Heavy bleeding comes from wounds to one or more large blood vessels. Such loss of blood can kill the victim in 3 to 5 minutes. Do not waste time, use pressure directly over the wound. Place clean pad (handkerchief, clean cloth, etc.) over the wound and press firmly with your hand or finger.

7. Shock. Keep victim lying down. Keep his airway open; if he vomits, turn head to the side so that his head is arched. If the victim's face is red elevate his head, if it is pale, elevate his legs.

8. Electrocution. The rescuer should disconnect the attachment plug from its socket or throw the main electrial switch if possible. It may be necessary to separate the victim from the contact by utilizing a long, very dry pole, a dry rope, or length of dry cloth. Be sure that your hands are dry and that you are standing on dry surface. If you are certified, BEGIN CARDIOPULMONARY RESUSCITATION AT ONCE.

9. Fainting. Fainting is a partial or complete loss of consciousness due to a reduced supply of blood to the brain for a short time. Occasionally, a person collapses suddenly without a warning. HAVE VICTIM LIE DOWN.

Revised 9/8/83 (Falk, Layman, Bardasis)

DEPARTMENT OF PHYSICS AND ASTRONOMY
University of Maryland

BE PREPARED TO MEET YOUR STUDENTS
(Try to visit with the Professor immediately)

1. Have a modest handout
   Your Name
   Office Number
   Office Hours
   Phone Number

(Write your name on the board each period for the first few weeks. Be sure each student knows who you are.)

Prepare a beief write-up in your words as to what you expect of your students in laboratory/recitation. Hints for good reports/homework with ideas of how you will score their work. (see VIII.2 TA Letter to his students)

Rules for handing in reports/homework
Rules for attaining the score on their work
Rules if they miss laboratory/recitation. How to make up work.

2. Borrow from Mr. Giza a Polaroid camera. Take pictures of your students 3/single photos. Have them add their names. Prepare a small poster (see example in Mr. Giza's office when you borrow camera) to use to learn your students and to post in lab during the first few weeks so they can get to know each other.

3. Consult the TA Handbook for added suggestions.

(Prepared by Dr. John Layman)

X. References on Teaching

Books

Wilbert J. McKeachie, TEACHING TIPS - A GUIDEBOOK FOR THE BEGINNING COLLEGE TEACHER, (D. C. Health and Co., 1969)

This book serves as a text for a course in College Teaching offered on this campus. Highly recommended.

Carl R. Rogers, ed., FREEDOM TO LEARN - STUDIES OF THE PERSON, (Charles E. Merrill Pub. Co., 1969)

Humanization of teaching may be of paramount importance in physics in terms of students' perception of our discipline. Sections of this book can help one develop a sense of this often neglected aspect of teaching.

Jerome S. Bruner, TOWARD A THEORY OF INSTRUCTION, (W. W. Norton and Co., Inc., 1966)

Written in memory of Francis Friedman, a physicist at M.I.T., instrumental in the production of the PSSC high school program. A classic work.

William H. Morris, Ed., EFFECTIVE COLLEGE TEACHING, (American Council on Education, 1970)

This book includes an essay by Morris H. Shamos on The Art of Teaching Science.

Articles

Strassenburg, A. A., "The Evolution of Physics Teaching," The Physics Teacher, December 1972.

McKennan and Renner, "Are Colleges Concerned with Intellectual Development?", American Journal of Physics, Sept. 1971, p. 1047.

Lawson and Renner, "Promoting Intellectual Development Through Science Teaching," The Physics Teacher, May 1973, p. 273.

Renner and Lawson, "Projection Theory and Instruction in Physics," The Physics Teacher, March, 1973, p. 42.

Cohen, H.D., "Cognitive Level and College Physics Teaching", American Journal of Physics, October 1978.

Hestenes, David, "Wherefore a Science of Teaching?", The Physics Teacher, April 1979.

Arons, A.B., "Cognitive Levels of College Physics Students", American Journal of Physics, July 1979.

Lieberman, D., "Correlation Between Logical Abilities and Success in Physics", American Journal of Physics, September 1979.

Rief, F. and M. St. John, "Teaching physicists' Thinking Skills in the Laboratory", American Journal of Physics, November 1979.

Larkin, J. and J. McDermott, "Expert and Novice Performance in Solving Physics Problems, Science, June 20, 1980.

Barnes, G., "Student's Scores on Piaget-Type Questionnaires Before and After Taking Two Semesters of College Physics, American Journal of Physics, September 1980.

Champagne, A., "Factors Influencing the Learning of Classical Mechanics", American Journal of Physics, December 1980.

Trowbridge, D, "Investigation of Student Understanding of the Concept of Velocity in One Dimension", American Journal of Physics, December 1980.

Maloney, D., "Piagetian Testing", American Journal of Physics, February 1981.

Karplus, R., "Educational Aspects of the Structure of Physics", American Journal of Physics, March 1981.

Reif, F., "Teaching Problem Solving - A Scientific Approach", The Physics Teacher, May 1981.

Larkin, J., "Cognition of Learning Physics", American Journal of Physics, June 1981.

Maloney, D.P., "Comparative Reasoning Abilities of College Students", American Journal of Physics, July 1981.

Karplus, R., "Response by the Oerstead Medalist: Autonomy and Input", American Journal of Physics, September 1981.

Wood, K.W., "An Investigation of CAI Teaching Methods in an Electronics Course", American Journal of Physics, August 1981.

For information on any of these sources see Dr. Layman. Many of these topics are discussed in PHYS 708: Seminar on Teaching College Physics.

Regular course descriptions and teaching procedure discussions appear in the American Journal of Physics, The Physics Teacher, and the Journal of College Science Teaching.

XI.1 LECTURE DEMONSTRATION AREA

TO: Teaching Faculty and Graduate Assistants, Physics and Astronomy
FROM: Richard E. Berg
DATE: August 1986
SUBJECT: Lecture-Demonstration Facility
Staff: Dr. Richard Berg x3520
Mr. Bill Norwood x4403

The primary purpose of the Lecture-Demonstration Facility is to aid and support the teaching program in the Department of Physics and Astronomy. To this end, this communication includes information on:

I. Teaching Materials

II. Audiovisual Equipment

III. Reference Materials

IV. Arrangements and Communications

A Lecture-Demonstration staff member will, in general, be present between the hours of 8:30 A.M. and 5:30 P.M. At other hours security precautions make it necessary to limit access to Lecture-Demonstration personnel, except by prior arrangement. Staff schedules will be posted on the bulletin board at the sign-up desk.

I. Teaching Materials

Materials are organized by physics topics and summarized in a set of index books kept in Room Z-0402. Please leave the index books in Room Z-0402 at all times. The index books, audiovisual aids, and most reference materials will be found in Room Z-0402. Duplicates of index books are available for temporary loan.

A list is available of Lecture-Demonstration materials used recently in several specific physics course: Physics 102; 106; 121-2; 141-2; 161, 262-3; and 191-2, 293-4.

Most Lecture-Demonstration materials and facilities are available anywhere in the Physics Building. By prior arrangement only, certain types of materials or equipment may be removed from the building.

The demonstration/movie/loop list at the sign-out table in Room Z0402 will be kept current with new aquisitions and developments. Descriptions of demonstrations and other materials obtained after publication of the yearly list will be added to the index books as they occur. Copies of the full list as of the date of this memo are available for distribution. New demonstrations developed during the previous year are indicated in the full list by an asterisk.

A. Demonstrations - Over 1000 demonstrations are now listed by topic in the index books, and are delivered as described and photographed in the index books. When further information is needed, it may be necessary to communicate with a Lecture-Demonstration staff members

Storage locations of demonstration equipment in Room Z-0406 are given the write-ups in the index books, and the locations can be found using maps of Z-0406 posted throughout the room. You are invited to browse

through the storage area to see what is available in your particular areas of need.

As always, we seek your advice in developing and procuing new demonstrations, which will be considered in the light of overall demand and general facility development. The procedure by which new demonstrations are added to the Lecture-Demonstration Facility includes an evaluation of need, engineering, and construction so as to ensure both reliabiliy and durability. New demonstration requests should in general pass through Dr. Berg. Please do not expect immediate service in the development of new demonstrations.

Faculty members and teaching assistants are welcome to use our workship and facilities to develop or improve demonstrations. Please discuss anticipated changes in our equipment with Dr. Berg.

B. Movies and Videotapes - About 160 16-mm movies and videotapes are now available. They are stored in Room Z-0402 and can be previewed in Room Z-0406. These movies are listed by topic in the index books; a one paragraph summary (generally from the distributor) is included, plus any comments contributed by faculty members. In addition to movies in our collection, we have listings of movies in areas related to physical sciences possessed by 1) Chemistry Department, 2) Mathematics Department, 3) Astronomy Department, 4) Psychology Department, 5) Undergraduate Library Non-Print Media Center, and 6) Audiovisual Services of the University of Maryland. Videotapes are included in the list with the movies. Movies in our library can, with adequate notice, be converted to videotape format for use in the Undergraduate Library Non-Print Media Center. Such tapes can be left at the Center for longer periods to allow students continued viewing access. We are transferring our movies to videotape so that they will be better preserved and more easily used.

C. Film Loops - Approximately 300 single topic super-8-mm film loops, listed by topic in the index books, are available. They are stored in a large filing cabinet in Room Z-0402 and can be seen using one of two preview projectors sitting on the film loop cabinet. Most of the film loops have descriptive material on their containers, therefore no summaries are available in the index books. Since each one only takes 3 to 4 minutes, it is often convenient simply to play for preview those loopsin which you might be interested. We have an extensive list of film loops available from the Chemistry Department. We are also transferring our film loops to videocassettes.

D. Slide Files - The following sets of slides are ~~not~~ now available:

1. Kodansha color slides: six volumes, covering most areas of physics.
2. A set of books indexed according to the Lecture-Demonstration index classification, into which most new slides will be filed.
3. A very large set of Optics slides, collected by Dr. David Falk.
4. A set of slides, largely from Time-Life pictorials, collected by Dr. Carroll Alley.
5. Several slide sets dealing with new forms of energy, energy sources, etc.
6. Several sets of slides showing activities of Research Groups.
7. The AAPT slide set "Women in Science".
8. A set of astronomy slides, not indexed.

In addition, a set of overlay transparencies covering most areas of physics (The Harvard Project Physics series) is available.

Complete listings of the slides in sets 1 and 2 above are

included by topic in the index books. The other sets have their own listings, which are found with their file books.

Donations to our slide file are welcome. Where possible please include originals or references from which additional copies can be made in case those on file are lost.

II. Teaching Support Services

A. An overhead projector and projection screen are provided in each classr oom. Projectors for super-8-mm film loops and 35-mm slides are stored in locked cabinets in each classroom; the locks can be opened using a faculty master key. Please, under all circumstances, make sure that when you leave the room the projectors have been returned to the cabinets and the locks secured.

Please see a Lecture-Demonstration staff member about showing 16-mm movies; because of the complexity of the projectors and the questionable quality of some of our older movies, we would like to offer help with them whenever our staffing allows. Where available, videotapes can be substituted for movies. Make arrangements with a member of the Lecture-Demonstration staff for either pick-up or delivery of film loops, slides, and other visual aids before class and their return to Room Z-0402 after use.

B. Other equipment available on request in the Physics Building:
   1. Audio tape recorders, microphones, amplifiers, and speakers.
   2. Color U-matic videocassett system, including TV camera, cassette recorder/player and monitor.
   3. A high-quality opaque projector.
   4. Audiocassette recorder with capability of cueing Kodak automatic slide projector.
   5. Computer terminal which can be plugged into existing wiring in each Physics classroom or lecture hall.
   6. Apple Computer System, with TV monitor and printer, which can be operated by itself or as a Tektronix graphics terminal when connected to the main computer.

We now possess the equipment to produce videotapes of class lectures, interviews, etc., which can then be placed for arbitrary periods of time in the UGL Non-Print Media Center or installed into our videotape library. Anyone desiring further information concerning our videotape production capability is requested to see Dr. Berg.

In addition to the above facilities, both color and monochrome TV projectors are available in the lecture halls (Z-1410 and Z-1412) only.

Seats in Z-1410 and Z-1412 (lecture halls) are numbered, and seating charts are available for use in organizing classes for exams or other use. A transparency of the seat numbering system can be projected on the front screens of the lecture halls as an aid for people finding their seats, and an E size blueprint (34" x 44") of the seating chart can be made to aid faculty members in writing down student seating assignments.

C. Glass display cases with locks are available in the following locations: 1) outside lecture hall Z-1412, 2) outside lecture hall Z-1410, 3) outside

room Z-1402, and 4) in the stairwell between the main Physics building and the lecture hall wing. These cases can be used to post homework solutions, grades, etc., and will be assigned on a first-come-first-served basis at the beginning of each semester.

D. A library of computer grading and grade sorting programs is being collec ted, and will hopeully be made available during the coming year. We should like to obtain information on existing grade programs and obtain requests for particular programs which might be of assistance to faculty members.

III. Reference Materials

Reference material relating to the various Lecture-Demonstration facilities is available for use by the faculty. These materials will be found in filing cabinets in Room Z-0402.

A. Background, reference, and related material to

1. Demonstration (filed by demonstration number)
2. Movies (filed alphabetically by title)
3. Film loops (filed by topic)
4. Slide originals and reference materials for slides (filed by topic)

B. Manuals for equipment which we own and instruction sheets for general pieces of equipment not specifically assigned to a particular demonstration.

C. Reference book library, including some texts.

D. General and specific descriptive information on demonstrations.

E. Catalogs:

1. General teaching equipment and demonstration equipment
2. Audiovisual: projectors, movies, film loops, and slides
3. Computer: hardware and software for both Apple and IBM

F. Inventory - Capital and non-capital equipment is listed so as to satisfy University and State requirements. The listing includes cost, sources, dates of purchase, purchase order numbers, and other information necessary to order equipment.

Note: Please do not remove reference material from room Z-0402. For duplication, ask one of the staff members.

IV. Arrangements and Communication

A. Sign-up book - A demonstration and facility sign-up book is found immediately inside the door of room Z-0402. We ask that in cases where it is possible, requests be made one day ahead of the specified class period. Demonstrations will be set up in lecture halls Z-1410 and Z-1412 approximately 30 minutes before class; for other classrooms, demonstrations will be delivered to the room shortly before or after class begins. Please check for scheduling conflicts when writing requests in the book.

In case of scheduling conflicts, priority is given for use of the equipment first in lecture halls Z-1410 and Z-1412, second in lecture classes in the Physics Building, and third, other. It is rarely possible to duplicate a demonstration needed in two places at once; conflicta should be worked out beforehand.

B. Intercom - An intercom unit will be found on the sign-up table at the entrance to room Z-0402, which is arranged to call any location in the Lecture-Demonstration Facility. In addition, assistance of Lecture-Demonstration personnel anywhere in the Facility can be obtained in lecture halls Z-1412 and Z1410 by pressing the call button on the lectern.

C. Suggestions - Comments, suggestions, or requests regarding demonstrations and other Lecture-Demonstration facilities, can be communicated in writing using the "Lecture-Demonstration Use Form." It is appropriate ot use this form to communicate problems and suggestions regarding demonstrations now available or those which you request for the future, and also comments on movies which you feel should be inserted into the Lecture-Demonstration index book page dealing with that movie.

To make a record of new demonstrations or demonstrations not previously recorded in the index books, use the "Demonstration Record Form." When recording a demonstration, ask that a polaroid snapshot be taken of the equipment. You should write on the Demonstration Record Form a short paragraph describing the demonstration and any important features which you feel should be retained when the demonstration is finalized and the write-up inserted permanently into the index book. Please see a Lecture-Demonstration staff member with questions about recording new demonstratins and requests to photograph the demonstrations for permanent record.

D. Equipment Failures - Report any and all problems or malfunctions of Lecture-Demonstration equipment and/or materials or permanent installations in any classrooms to one of the staff members as soon as possible.

XI.2 ELEMENTARY LABORATORY FACILITIES

The elementary lab equipment storage and lab rooms are located on the third floor in Rooms Z-3213 through Z-3316; the telephone extension is 4045. In this area students enrolled in Physics 114, 117, 121, 122, 141, 142, 262, 262A, 263 and 263A have their laboratory sessions.

Presiding over the elementary laboratory facilities are Dr. Gus Zorn and Mr. Tom Giza and Mr. Tuck Owens. Their responsibilities are to keep the equipment in good repair and distribute it to the rooms where and when it is needed. If you have equipment problems during you lab session which you are unable to repair, don't hesitate to call on them for assistance.

Many times specific constraints on student handling of the equipment or take down procedures are suggested by Mr. Giza or Mr. Owens. Your cooperation in complying is essential.

On the other hand, you may discover improved procedures, or errors in the lab manual. Please share these with Mr. Giza and Mr. Owens.

Miscellaneous items such as pens, pencils, graph paper, metric rulers, and protractors MUST BE FURNISHED BY STUDENTS. TA's should make this known right away.

The following procedures would help make elementary labs operate more smoothly:

1. During a make-up session, only the experiments scheduled since the previous make-up session will be set up in the lab.

2. If laboratory equipment does not function properly, please notify us immediately so that a replacement may be made. Place a red tag on the defective apparatus.

3. Please have students leave lab equipment in an orderly fashion and the experiment in proper working condition so that the next lab group can start their experiment without being delayed.

4. All electrical equipment must be turned off or unplugged at end of lab session.

5. Please help us stop laboratory vandalism. Teaching assistants should always be present when students are working in the lab, and doors are to be locked when lab is over.

6. When you have any special experiment or equipment needs, <u>give us a written notice well in advance</u>. Vocal requests are easily forgotton or misunderstood and should always be accompanied by a note.

7. Certain items will be signed for (signed out, signed in) by you, the TA.

8. Concern yourself with the safety of the students and of innocent bystanders, as well as with the well being of the equipment.

9. PLEASE BE CONSIDERATE OF THE CLASSES THAT FOLLOWS YOURS.

XI.3 ADVANCED LABORATORIES

The Advanced Laboratory courses are Physics 195, 196, 295 and 295H, 296, 395, 495 and 107. These meet in Lab Rooms Z-3104, 3203, 3210, 3211 and 3214 located on the third floor of the Physics Building.

Dr. Derek Boyd and Mr. Allen Monroe are in charge of the Advanced Laboratories. Lab operation and operational difficulties should be discussed with Mr. Monroe in room Z-3202, phone 454-4318.

XI.4 SLAWSKY PHYSICS CLINIC

Although the Teaching Assistant will spend a fair amount of time answering the questions of individual students, both during recitations and labs and during office hours, nevertheless, some students will need additional individualized attention. Recognizing this, the Department has provided several different facilities which attempt to provide this kind of help. The TA should be familiar with the clinic so as to help students make optimum use of it.

For students taking PHYS 121, 122, 141, 142, 161, 262, 263

The Physics Department, with the help of Drs. Milton and Zaka Slawsky, established a free tutoring service for students taking the above listed basic Physics courses. This facility, called the "Physics Clinic," provides over 100 additional contact hours for the students.

The Physics Clinic operates by going over material current in each of the courses repeatedly during the day, starting at the beginning of each scheduled hour. This is intended to provide the students a wide choice of times and to keep tutoring groups small. Student are welcome to come at any hour to listen to and participate in the ongoing discussion. The objective is to improve the ability of the student to set up and solve problems.

The clinic is staffed by physicists who have retired from high level scientific, teaching, research and administrative positions. They have broad experience in application of physics and a strong desire to help students. These men are particularly sensitive to the problems of establishing effective communication between teacher and student. As they have said, their purpose is to make the students' experience with physics as happy as possible.

The Physics Clinic is located in Room Z-1214 (454-5392). It will be open to students every week day from 10:00 a.m. to 3:00 p.m.

XI.5 DUPLICATING FACILITIES & PRINT SHOP

There is an excellent duplicating facility in Room Z-0220 under the direction of Mr. Gene Barth. It offers Kodak Copiers on a do-it-youself, first come basis; these copies must be charged to your course account number. For your work with the students, there is a Ditto machine; help is always available when needed to operate this machine as well as the Kodak copiers. Please limit your work on the copiers to 25 copies or less, anything larger use the Ditto or have it printed. Please check with Mr. Barth to be sure you are using the cheapest possible method when you run off a large number of copies.

COPIERS

Kodak 100. Highly efficient and excellent quality with document feeder and collator. Very high volume machine.

Kodak 150. Features reduction capabilities at 77% and 64%. Again, excellent quality.

Savin 5040. Located on the fourth floor, features reduction and enlargement, Low volume and good quality.*

Savin Located in the Engineering and Physical Sciences Library (Math Building) in room 1403B.*

*The T.A. Infortext card can not be sent to these two machines, it must stay in room Z-0220.

To use the walk-up copiers, a person needs an Infortext "credit card" which is inserted into the System slot and activates the machine. Credit cards can be issued to teaching assistants under individual course numbers by presenting a permission to get a card note from the Professor to Ms. Mary Lou Jordon in room Z-1105.

To copy documents for personal use, one may obtain a card from Mr. Barth in the Print Shop and pay directly.

CASH COPYING HOURS - 8:30 am till 10:00 am ONLY.

PRINTING

We have 2 OFFSET Printing presses for printing any quantity of copies. All work to be printed MUST be channeled through Mr. Barth, supervisor of the shop. This facility includes: Reduction, Collating, Stapling, Colored inks, Colored paper, Embossed Cover stock, Card stock, Plastic Binding, Cutting, Folding, laminating NCR paper and many other services.

SHOP HOURS

8:30 AM until 4:00 PM -------- CLOSED from 12 noon until 12:30 PM
No cash copying after 10 AM.

No T.A. card between 12 - 12:30 PM or after 4 PM.

XI.6 COMPUTING FACILITIES

Computing facilities for instruction and research are provided by the Computer Science Center of the University of Maryland. The Computer Science Center presently has Univac 1100/92, IBM 4341, 4381 and 3081 available for use by faculty and students. These are the powerful modern computers, used to principally support undergraduate and graduate computing both in connection with class work and doctoral research programs. They are used interactively from a terminal ("demand mode"). One limitation in the use of these computers is that reading and writing of tapes is not supported for classroom accounts. Research accounts permit tape mounting and access.

Terminals for interactive computing on any of these machines are available in Room 3335 of the Physics Building, in the Computer Science Center, or in the MPSE Division Terminal Room in the Engineering and Physical Sciences Library. These terminals are available to anyone holding a Physics Computer Account Number. You can get detailed information about the procedure for obtaining a Computer Account Number from your advisor, from the Professor in charge of the course you are assisting in or from the Computer Science Center. In case of unusual difficulty Mr. Charles Smarsh is available to answer questions on matters related to computing in the Physics program. Dr. Richard Berg is also currently compiling a library of programs which can be of considerable use to TA's for maintaining records for large classes.

XI.7 STUDENTS MACHINE SHOP

The Student Machine Shop is located in the south basement of the Physics Building in Room Z-0125; phone extension 2643. It is open Monday-Friday from 10:30 a.m. to 5:30 p.m. Mr. Ben Scesa, supervisor of the shop, is available to advise you in using the equipment and shop techniques.

During the term, a one credit course, PHYSICS SHOP TECHNIQUES, is taught by Mr. Scesa. This can help familiarize you with the equipment, but is not a prerequisite to using the shop.

XI.8 DEPARTMENTAL COMMITTEES

Many of the policy decisions in the Physics Department are reached by committees of the faculty and students. Several of these committees are directly concerned with the quality of teaching in the Department and may be of direct concern to the Teaching Assistants.

Although the list of Departmental committees is almost endless, a few are:

General Committee on Graduate Education in Physics
Graduate Advisory Committee
Teaching Excellence Committee
Qualifying Examinations Committee
Physics Graduate Student Assembly

Additionally, the Mathematics, Physical Science and Engineering Division Plan of Organization requires certain Division committees to have student representation, so keep this in mind as your program progresses. Should you wish to serve on one of these committees, please tell Dr. Bardasis.

XI.9 OFFICE SERVICES, MAIL, AND SALARY INFORMATION

The lobby window beside the mailboxes is run by Mrs. Harriet Husman. At the beginning of the term, you should obtain a mailbox assignment from her, and during the first week of classes, leave with her your office and home addresses and phone numbers for inclusion in the Physics Department Directory, usually published during the early fall.

All TA's and RA's will pay for parking this year ($25 for the first car and $10 for each additional car or motorcycle). If registering car and cycle ALWAYS register car first.

If you are a TA:

DO NOT ask your students to bring their homework to physics mail room to be placed in your mailbox. All homework should be taken to your office if not turned in during class.

Your paycheck is obtainable every two weeks on Friday in the lobby from Ms. Fahey. For further information, please talk with Ms. Fahey in Room Z1101.

Supplies for your TA duties may be obtained from Harriet Husman, Room Z1115. This would include class record book, scoring pens, and tablets.

XII. TELEPHONE POLICY

Telephones should be treated as business phones; personal calls may be made in the event of an emergency. In no case should long distance calls be placed from a University phone number. If you do place such a call, you will be charged not only the cost of the call but also a surcharge to cover the cost of having to track you down.

XIII. GUIDE TO THE ENGINEERING AND PHYSICAL SCIENCES LIBRARY

UNIVERSITY OF MARYLAND

GENERAL INFORMATION

The Engineering and Physical Sciences Library has four floors. There is a current periodicals rooms, a reference room containing indexes, abstracts and other reference tools, the Maryland Patent Research Center, and the Center for technical reports and government documents.

The book stacks are open to all users. The three stack floors may be entered from the stairway on the lst floor. An elecvator is available for access to the second and third floors. A stack directory showing call number locations is posted near the card catalog, and signs indicate the call numbers found on each floor. Study desks/carrels are located on all stack floors.

Books used in the stacks should be put on colored shelves or a book truck for reshelving by Library Staff. Books selected for home use must be charged out at the Loan Desk. There is a book return at the building entrance for use when the library is closed. Technical reports are charged out in the Technical Reports Center.

GROUND FLOOR

Technial Reports Center (Rm. 0403 - Tel. 454-4051) AEC/ERDA, DOE, NASA and other reports from government sponsored research projects are located here (note: the indexes to these materials are located in the first floor Reference room). Also, faculty reports, research reports from other universities, engineering experiment station and water resources reports are housed in the Center. NASA and DTIC Computer searches may be requested here.

FIRST FLOOR

Information Desk (Rm. 1403 - Tel. 454-3037) The Librarians are available to provide reference assistance, help you use the card catalog and serials list, and advise you about other library resources and services. You may also seek assistance at the Information Desk or at the Loan Desk.

Loan Desk (Rm. 1403 - Tel. 454-3039) Charge out books at the Loan Desk. Return them in the book return slots at either end of the counter. Ask for a receipt for any returned materials. An automated loan system shows the books charged out to borrowers or shelved temporarily in special locations. If an item is badly needed it may be recalled from the current borrower.

Reserve Book Collection (Rm. 1403 - Tel. 454-3039) Reserve books are housed behind the Loan Desk. Regulations for borrowing reserve books are posted at the service desk; reserve books should be returned to the loan desk attendant.

Card Catalog (Rm. 1403) The card catalog lists only materials held by this library. Author and title cards are arranged in one alphabetical sequence and the subject cards in another.

Note: Complete holdings of bound and microfilmed periodicals as well as

the location of current unbound journals are found in the Serials List on microfiche, located near the 1st Floor Information Desk and the card catalog. Other copies are located on the second and third floors. Materials not listed in the card catalog include: College catalogs (located in the Reference Room); Selected U.S. Government publications (located in the Technical Reports Center).

Reference Room (Rm. 1403L - Tel. 454-3037) This room houses the reference collection including encyclopedias, atlases and dictionaries, abstracts and indexes. The librarian at the Information Desk will help you in using them. Specialized materials such as EIC Artifical intelligence and robotics microfiche are in this room.

Patent Research Center (Rm. 1403B). A collection of U.S. Patents on microfilm (1790-1871,1944-) are available here, along with the reference materials needed to conduct a patent search.

Calculators (Rm. 1403) Three calculators are available for public use, including a statistical calculator. Instruction manuals for these machines are available at the Loan Desk.

Interlibrary Loan Service (Rm. 1403L - Tel. 454-3037) Books and other needed materials not owned by the Library must be borrowed from other library collections through this service for faculty and graduate students. Regulations for using the service may be obtained from the Reference Office.

Journals Office (Rm. 1403A - Tel. 454-3038) The staff member on duty will aid you in identifying and locating journals (currently received and bound) and other serial publications.

Current Periodicals Room (Rm. 1403) Unbound journals are arranged alphabetically within two major subject areas: Science (including Engineering, Physics and Earth Sciences) and Mathematics. Newly received journals are displayed in a smaller section nearby for one week then are moved to the regular current periodicals shelves.

Computer-Assisted Research Service Many data bases in the physical sciences and engineering are available. Information concerning the on-line search service may be obtained in the Reference Office, Rm. 1403.

Photocopying (Rm. 1403) Coin operated photocopiers are located along the wall by the elevator. A copier in the microfilm room may be used if you have a valid card for the Physics Department Infotext system.

SECOND FLOOR

McKeldin Storage (Rm. 2403) Lesser used materials from McKeldin Library are shelved here arranged by Library of Congress call number. This area, near the Microfilm room and Computer Laboratory, is open for individual study.

Book Stacks (Rm. 2403) All monographs (books) are housed on the 2nd floor arranged by Library of Congress call number, A-Z.

Microfilm (Rm. 2403E) Journals on microfilm are located in a separate room near the computer laboratory. Coin-operated reader-printers are available in the same room. The patents collection is also housed here.

Computer Laboratory (Rm. 2403F) Decwriters and terminals connected to computers in UMCP Computer Science Center may be used by anyone with a current account.

Photocopier: A coin-operated photocopier is located along the wall by the elevator.

THIRD FLOOR

Journal Stacks (Rm. 3403) All serials (journals) are housed on the 3rd floor arranged by Library of Congress call number, A-Z.

Group Study Rooms (Rms. 3403) May be used by small groups for quiet study requiring consultation.

Photocopier: A coin-operated photocopier is located along the wall by the elevator.

Floor plans and more detailed information are available in the library.

LIBRARY HOURS

Monday - Thursday	8 a.m. - 12 midnight
Friday	8 a.m. - 8 p.m.
Saturday	10 a.m. - 8 p.m.
Sunday	12 noon - 12 midnight

Variations in hours (e.g., vacation and summer hours) will be posted.

PLEASE, NO EATING AND/OR DRINKING IN THE LIBRARY

XIV. THE COUNSELING CENTER

Since the Teaching Assistant is the major contact with students, there may be occasions, when you are working with students, that you can sense that the student may benefit from some of the services provided by the Counseling Center. It is with this in mind that we are enclosing a brief description of the Counseling Center and the programs offered. On many occasions some of the programs can be very helpful to graduate students in physics. Don't ignore them. The Counseling Center quite often serves as an information source for faculty and students. If you are not sure what service on campus would be most appropriate for you or your students, call them - they will refer you to the best place.

The Counseling Center

This material has been prepared to quickly inform you about the Center. It should be particularly useful should you have questions about our services or occasions to consult with us. Your inquiries are welcome either in person at the Shoemaker Building or by phone, (454-2931).

We systematically follow up every nth person who has received services in order to learn of each person's impressions of the Center and what effect our services have had.

SPECIAL PROGRAMS FOR THE COUNSELING CENTER

In addition to its other services, the Counseling Center offers students a variety of programs designed to help students make maximum use of their potential while at the University, and in their lives after they leave the campus.

Examples of These Special Programs:

Alternatives to the U. of Maryland
Anxiety Management
Assertive Behavior Training
Career Decision-Making Workshops
Couples Communication Program
*Dial-a-Tape Recorded Conversations
Exam Skill Workshop
Graduate Record Exam Preparation Program
*Individual Vocational Planning (IVP)
Interpersonal Growth Groups
Returning Students Group
Self-Esteem Workshop
Self Management (Smoking, weight loss, etc.)
Sexuality Workshops
Study Skills
Term Paper Workshops
Time Management Workshops
Transition Groups for Black Freshman
Single Parent Group
Stress Management

For information about the dates, times and details of each program, stop in at the Counseling Center (Shoemaker Building). Pick up a copy of our schedules which are printed each semester.

*--Self help programs - ask the receptionist.

The Counseling Center is organized into six parts and the following provides a brief description of each.

COUNSELING SERVICE

The Counseling Service within the Counseling Center annually works with approximately 2000 students with vocational-educational, and/or emotional-social corners. All UMCP undergraduate and graduate students are eligible for counseling (at no fee). Depending upon the needs of the students applying for counseling service, the counseling may involve testing and may be either individual or group.

The professional staff within this service consists of 15 Counseling or Clinical Psychologists, plus four full-time interns. We are also engaged in substantial amounts of consultation, training, research, and teaching (the majority hold academic rank in either Psychology or Education).

Counseling Services are available to any UMCP student who contacts us Monday through Friday from 8:30 a.m. - 4:30 p.m. In addition, some evening appointment hours are available (6:00 - 8:30 p.m. Monday - Thursday during the academic year). There is a Center Receptionist available 8:30 a.m. - 9:00 p.m. Monday - Thursday and from 8:30 a.m. - 4:30 p.m. on Friday during the academic year. The confidential nature of our counseling interviews are in accordance with our professional ethical standards.

LEARNING ASSISTANCE SERVICE

The Learning Assistance Service (LAS) works with about 2500 individuals annually and offers individual and group credit and non-credit programs designed to improve learning skills. We offer skilled assistance on tape, individually, and in groups in the following areas of academic success skills:

English as a Second Language

Examination Skills - essay and multiple choice

Grammer and Mechanics of English

Listening and Notetaking

Math Learning Skills

Reading Rate and Comprehension

Spelling

Term paper preparation

Textbook Skills

Time Management and Avoiding procrastination

Vocabulary

Writing Skills

Individualized Programs: Call 454-2935 or stop at our receptionists' desk, second floor, Shoemaker Building, to make an appointment with a counselor. In the initial interview, the counselor will help you select an appropriate program, get you started, and give assistance as needed.

Workshops: A variety of workshops are offered throughout the year. Schedules are available at the LAS receptionist desk. Just register and attend. Offerings include:

Building Math Confidence	Listening and Notetaking
Developing Algebraic Skills	Study Skills
Exam Skills	Time Management

Credit Courses: Two one-credit courses, conducted by LAS staff, are also available. See the Schedule of Classes for meeting times.

EDCP 108B - Transition course to bridge the academic changes that occur between high school and college. Topics covered include study skills, how to prepare for and take exams, time management, as well as general and survival and success skills.

EDCP 108R - For students attending college after a break in their education. Focus on such areas as career and personal planning, studying skills, anad making the transition back to school.

College Bound Program: Our College Bound Program in LAS goes on throughout the academic year and the summer sessions. It is designed primarily for high school juniors and seniors who desire skills assistance and intend to go on to college. The emphasis is on improvement of reading and studying skills rather than on remediation. The program consists of individual and group help in: Listening and notetaking development, Reading Efficiency (Speed and Comprehension Skills), Time Scheduling, Study Organization and Examination Skills.

Hours: Fall and Spring Semesters: Monday 8:30 a.m. to 7:00 p.m.; Tuesday-Friday 8:30 a.m. to 4:40 p.m. Summer Sessions, Vacations, etc. (When UMCP is open): Monday-Friday 8:30 a.m. to 4:30 p.m.

DISABLED STUDENT SERVICES

The Disabled Student Service (DSS) was created to ensure that disabled students would find responsive and skilled assistance at the University allowing them equal access to the University and its many programs.

DSS is located in the ground floor corner of Shoemaker Building which has an accessible entrance on the north and south sides of the building. The telephone numbers are 454-5028 and 454-5029 via TTY.

Specific services include priority registration, interpreting service, reader service, a test/quiz administration service, consultation services with staff, faculty, and administrators, equipment loan, orientation to campus, and accessibility information for students and their families.

TESTING, RESEARCH AND DATA PROCESSING UNIT

Testing: This includes conducting testing programs for a variety of University units. It also includes administering all testing done as a part of our Counseling or Learning Assistance Services. We also serve as a regional testing center for a variety of national testing programs (College Level Examination Program, National Teachers Exam, Graduate Record, Miller Analogies, Medical School Admission Test and Law School Admission Test).

Research: This program typically produces 10 to 20 research studies annually. The studies include a variety of surveys dealing with such topics as racism, drug attitudes and usage, educational and vocational planning, roles of women, etc. In addition, it conducts various lcoal test norm studies, academic prediction studies, evaluations of various local programs within the University.
Data Processing: This unit provides extensive consulting and operational help to a wide variety of campus units needing data of various types and in different forms, in addition to the support for Center research studies, preparing computer programs, etc.